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COMBINED CATALOG, VOLUME I
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The provisions of this publication are not to be regarded as an irrevocable contract between the student and the University of Maryland. Changes are effected from time to time in the general regulations and in the academic requirements. There are established procedures for making changes, procedures which protect the institution's integrity and the individual student's interests and welfare. A curriculum or graduation requirement, when altered, is not made retroactive unless the alteration is to the student's advantage and can be accommodated within the span of years normally required for graduation. When the actions of a student are judged by competent authority, using established procedure, to be detrimental to the interests of the University community, that person may be required to withdraw from the University.

COMBINED CATALOG

1968-1970 SERIES

Volume I

COLLEGE PARK CAMPUS UNIVERSITY OF MARYLAND

The 1968-1970 Series of University of Maryland Catalogs is published in a two-volume set of combined catalogs. Volume I contains catalogs pertaining to academic units located on the College Park Campus. Volume II contains catalogs pertaining to academic units located on the Baltimore Campus. This is Volume I.

Catalogs in this volume are located
in this order:

*Adventure in Learning
(General Information)*

College of Agriculture

College of Arts and Sciences

*College of Business
and Public Administration*

College of Education

College of Engineering

College of Home Economics

*College of Physical Education,
Recreation and Health*

Graduate School Announcements

*School of Library
and Information Services*

Summer School

University College

AN ADVENTURE IN LEARNING

A GUIDE TO THE
UNDERGRADUATE PROGRAM

UNIVERSITY OF MARYLAND



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Number 6

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The primary purpose of the University of Maryland is to help students develop their talents and capabilities. For those who enroll, it can be an exciting adventure in learning.

WILSON H. ELKINS

PRESIDENT, UNIVERSITY OF MARYLAND

University Calendar, 1969-1970

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m. Christmas recess ends
	15	Wednesday	After last class—end of instruction
	17-24	Friday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
APRIL	3	Thursday	After last class—Spring recess begins
	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
AUGUST	4-8	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

FALL SEMESTER, 1969

SEPTEMBER	8-12	Monday-Friday	Fall Semester Registration
	13	Saturday	Teacher Registration
	15	Monday	Instruction begins
NOVEMBER	26	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	1	Monday	Thanksgiving recess ends
	19	Friday	After last class—Christmas recess begins

1970

JANUARY	5	Monday	Christmas recess ends
	14	Wednesday	Pre-exam Study Day
	15-22	Thursday-Thursday	Fall Semester examinations

SPRING SEMESTER, 1970

FEBRUARY	2-6	Monday-Friday	Spring Semester Registration
	7	Saturday	Teacher Registration
	9	Monday	Instruction begins
MARCH	26	Thursday	After last class—Spring recess begins
APRIL	6	Monday	8:00 a.m.—Spring recess ends
MAY	27	Wednesday	Pre-exam Study Day
	28-June 5	Thursday-Friday	Spring Semester Examinations
JUNE	1	Monday	Memorial Day
	6	Saturday	Commencement Exercises

SUMMER SESSION, 1970

JUNE	22-23	Monday-Tuesday	Summer Registration
JUNE	24	Wednesday	Instruction begins
AUGUST	14	Friday	Summer Session ends

SHORT COURSES, 1970

JUNE	15-18	Monday-Thursday	College Week for Women
AUGUST	3-7	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	8-11	Tuesday-Friday	Fireman's Short Course



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An Adventure in Learning

This booklet is the all-purpose general information publication of the University of Maryland at College Park. It is designed to assist the student as he begins his adventure in learning as an undergraduate student.

It contains the information needed

- to arrange a high school curriculum for acceptance by the various colleges of the University
- to help select a course of study at the University
- to apply for admission
- to matriculate
- to begin financial planning

More complete information will be found in the pertinent college course catalog.

- This college course catalog will be made available to the student after he enters the University, or
- He may consult reference copies in his high school library, principal's office, or office of the guidance counselor. College catalogs usually require interpretation for new freshmen students and should, therefore, be used in consultation with the high school guidance counselor or principal.
- Students who aspire to do graduate study should refer to the Graduate School Catalog.

The University of Maryland

In the year 1807 a School of Medicine was chartered in Baltimore. Five years later the charter was expanded to permit the addition of Faculties of Divinity, Law, and Arts and Sciences under the name, University of Maryland.

The initial development at College Park began in 1856 as an agricultural college. Later this unit became the land-grant college of Maryland within the terms of the Morrill Act of 1862. With the passage of time additional curriculums and colleges were added.

In 1920 the two institutions were combined under a single Board of Regents with University of Maryland being retained as the overall name.

In 1886 the Delaware Conference Academy was founded by the Methodist Church in Princess Anne, Maryland. The institution was taken over by the State of Maryland in 1926 and became a division of the University of Maryland in 1948. This unit, now called Maryland State College, is autonomous and has its own president.

A new campus was opened at Catonsville, Maryland, in September, 1966. This campus is a branch of the University, serving the Baltimore metropolitan area. Since the location is in Baltimore County the campus is referred to as University of Maryland, Baltimore County (UMBC).

Maryland State College and UMBC provide their own publications. For this reason their curriculums, admission requirements and procedures, costs, and other pertinent information are not presented in this catalog.

The University Today

The University of Maryland is a comprehensive educational unit offering curriculums in over 120 fields. These curriculums are offered through the major academic divisions of the University. The academic divisions are:

At College Park

- College of Agriculture
- College of Arts and Sciences
- College of Business and Public Administration
- College of Education
- College of Engineering, the Glenn L. Martin Institute of Technology
- College of Home Economics
- College of Physical Education, Recreation, and Health
- University College
- Graduate School
- School of Library and Information Services (Graduate level only)
- Summer School
- School of Architecture
- School of Nursing (First two years)
- School of Pharmacy (First two years)

At Baltimore City

- School of Dentistry
- School of Law
- School of Medicine
- School of Nursing
- School of Pharmacy
- School of Social Work

In Baltimore County

- University of Maryland—Baltimore County

At Princess Anne

- Maryland State College

Other resources of the University include the Computer Science Center, the Agricultural Experiment Station, the University Hospital, the Psychiatric Institute, the Natural Resources Institute, and various institutes and bureaus.

The Libraries of the University of Maryland consist of the general University library (the Theodore R. McKeldin Library), the Engineering and Physical Sciences Library, and the Chemistry Library at College Park; and the Health Sciences Library and Law Library in Baltimore. The library collection has risen to nearly one million volumes, and over 12,000 periodicals and newspapers are received currently. In addition, the College Park libraries contain over 150,000 United States Government and United Nations Organization documents.

The University's Educational and Research Programs are enhanced by its participation in the activities of the Southern Regional Education Board. The

Southern Regional Education Board encourages arrangements between institutions whereby high cost educational programs are shared. For example, during the past 15 years Maryland residents have been provided veterinary medical training through a cooperative arrangement with the University of Georgia and with the Tuskegee Institute. Medical and dental education arrangements have been effected with Meharry Medical College. The University's School of Dentistry, in a similar manner, provides for contract students from certain states where schools of dentistry have not been established. A cooperative program in Forestry has been arranged with North Carolina State. The usual state participation involves paying the out-of-state fee and, in some instances, program support as well.

Objectives of the University

Although the University is a state institution quite large in physical plant, student enrollment, number of curriculums offered, and services performed, its objectives remain constant and form a base for all educational activity. Simply stated they are: (1) to prepare students in the arts, the humanities, the basic and applied sciences, and the professional curriculums; (2) to contribute to the civic, moral, cultural, spiritual, and general welfare; (3) to provide general education in its broadest sense, both formal and informal, for all students who enroll; and (4) to develop those ideals and finer relationships among students which characterize cultured individuals; (5) to conduct systematic research and to promote creative scholarship; and (6) to offer special, continuation, and extension education in communities where it is feasible to do so.

Undergraduate Admissions

Freshman Admission

Admission from secondary school is based upon evidence indicating the applicant's probable success in the program of his choice. By the word "evidence" the University means that:

1. The applicant's scholastic average in college preparatory subjects during the last two years in high school has been satisfactory;
2. The applicant's high school principal has recommended him for admission;
3. The applicant will have graduated from high school before his first registration with the University;
4. The applicant has successfully completed the high school subjects required for the college and curriculum for which he is applying (the recommended program for each applicant would include three or four years of college preparatory mathematics);

5. The applicant has completed the Scholastic Aptitude Test and has requested that the results be submitted to the University. He should take the SAT before the end of the Fall Semester preceding his enrollment at the University in order to assure the completion of the processing of his application. The applicant should apply in writing to the Educational Testing Service, Princeton, New Jersey 08540, to request to take the test. In order to have the test results sent to the University of Maryland at College Park, the applicant must indicate the College Park Campus code number, 5814, in the proper places on the test.

Applicants for the September term who are found to meet admissions requirements may be sent an offer of admission, and they are then required to submit the enrollment deposit of \$50 within three weeks after the date of this offer. Failure to submit the enrollment deposit within the required time limit will be taken as evidence that the applicant is not seriously interested in admission, and the offer will be cancelled.

Refunds of the \$50 enrollment deposit will be made, provided the request for the refund is received by the Admissions Office on or before June 1, 1969.

Advanced Placement

Students entering the University from secondary school may obtain advanced placement and college credit on the basis of their performance on the College Board Advanced Placement examinations. These examinations are normally given to eligible high school seniors during the May preceding matriculation in college.

For achievement of a score of five or four on a given examination, the student will be granted Advanced Placement and the credit equivalent of two semester courses in that field; for achievement of a score of three, Advanced Placement and the credit equivalent of either one or two semester courses, depending upon the field of the examination, will be granted. A student earning this credit and placement needs not do additional work in the subject unless his curriculum requires it.

The program allows students a maximum of thirty hours credit, which may be used to meet major, minor, or elective requirements; or, where appropriate, General Education requirements. Included in the University's program are Advanced Placement examinations in the following areas: biology, chemistry, classics, English, history, Latin, mathematics, and physics.

Questions about the program may be addressed to the Director of Admissions and Registrations, College Deans, or the Director of General Education. For detailed information about examinations and procedures in taking them, write to Director of Advanced Placement Program, College Entrance Examination Board, 475 Riverside Drive, New York, New York 10027.

Pre-College Summer Session

Any Maryland resident whose scholastic average in academic subjects for his junior year in high school and the first semester of the senior high school year falls below the "C" level will be required to attend the University Pre-College Summer Session. If he completes successfully the Pre-College Summer Session, he will be admitted to the Fall Semester as a fully qualified student.

The Pre-College Summer Session is held at College Park, Maryland, and is preceded by a brief orientation period. It is open only to Maryland residents. During this session, which runs concurrently with the regular University summer session, students are required to take six academic hours, three of which must be English 1. A special program of advisement and counseling as well as reading and study skills instruction is provided. Alternatives to this special session, and the achievement required to remain in the University, have been explained to Maryland high school principals and counselors and are contained in a special brochure sent to students required to attend the Pre-College Summer Session.

A student whose average falls below "C" as noted above **MUST HAVE HIS APPLICATION AND HIGH SCHOOL RECORD INCLUDING HIS FIRST SEMESTER SENIOR GRADES IN THE ADMISSIONS OFFICE AT COLLEGE PARK ON OR BEFORE MAY 1, 1969 TO BE CONSIDERED FOR ADMISSION.** The Scholastic Aptitude Test results for students with less than a "C" average must be received by May 16, 1969.

Transfer Student Admission

An applicant must be in good standing as to scholarship and character to be considered for admission. Applicants for transfer are required to have a minimum cumulative average of "C" (2.0) in all previous college work.

Advanced standing is assigned to a transfer student from an accredited institution under the following conditions: (1) A minimum of one year of resident work at the University of Maryland, or not less than 30 semester hours, (including the meeting of all University and curricular requirements) is necessary for a degree; (2) The University reserves the right to make the assignment of transfer credit conditional upon the student's making a satisfactory record during his first semester at the University; (3) The University reserves the right to revoke advanced standing if the transfer student's progress is at any time unsatisfactory; (4) The courses transferred are acceptable to the particular curriculum in which the student matriculated and each course transferred carries a grade of "C" in a grading scale with "A," "B," "C" and "D" as passing grades. The transfer student may obtain a course catalog from the dean of the college in which he will enroll.

The Special Student

An applicant who is twenty-one years of age and who has not completed the subjects required for admission may be admitted to such courses as he seems qualified to take. A special student is ineligible to matriculate for a degree until he has satisfied the entrance requirements. A special student may also be one who meets entrance requirements but who does not wish to pursue a program of study leading to a degree.

The Foreign Student

The foreign student applying for admission to the undergraduate schools of the University of Maryland should make application at least six months in advance of the term for which he is applying. He will be required to submit an application for admission on a form furnished upon request by the Admissions

Office of the University, official copies of his secondary school preparation, certificates of completion of state secondary school examinations, and records of college or university studies completed in schools in the United States or elsewhere. He will also be required to furnish proof of adequate finances and of his ability to read, write, speak, and understand English sufficiently well to pursue satisfactorily an approved course of study in one of the colleges of the University. Arrangements can be made through the office of the Director of International Education Services and Foreign Student Affairs for administering an English test to prospective students both in the United States and in countries abroad.

The foreign student accepted for admission to the University will receive from the Director of Foreign Student Affairs the appropriate immigration form needed to secure a student visa from the American consul.

Every foreign student is expected to notify the Director of Foreign Student Affairs as to the approximate date of his arrival at the University and arrange to arrive in time for the special orientation program that precedes registration. The office of the Adviser is located in the North Administration Building, Room 222-A.

Application Procedures

Application forms may be obtained by writing to:

Director, Office of Admissions
North Administration Building
University of Maryland
College Park, Maryland 20742

Application forms are supplied to Maryland high schools upon request. Seniors in high school may obtain the forms from their high school counselors.

Applicants for a September term should submit their applications during the preceding fall. A non-refundable \$10.00 application fee is required with each application and all applicants must carefully complete the form in accordance with the directions printed on the application blank. Incomplete forms cannot be processed.

Closing Dates for Applications

FALL SEMESTER

All applications for full-time undergraduate admission for the fall semester of 1969 at the College Park campus must be submitted to the University between October 1, 1968 and June 1, 1969 (Note earlier date for foreign students and the date of May 1, 1969, for Pre-College Summer Session students). High school students are encouraged to file their applications for admission during the fall months of their senior year. Any student registered for nine or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission, must be received

by the appropriate University office by July 15. This means that the applicant's educational records (except current summer school grades), SAT scores (in the case of new freshmen) and medical examination reports must be received by July 15.

SPRING SEMESTER

The deadline for the receipt of applications for the spring semester in 1969 is January 1, 1969. (Foreign students are required to submit applications six months in advance.)

Orientation Programs

Freshmen Orientation and Registration

Upon final admission to the University the student will receive materials pertaining to his participation in The Freshmen Orientation and Registration Program for the University of Maryland. **ALL ENTERING FRESHMEN ARE REQUIRED TO ATTEND THIS PROGRAM.** The program is operated at the College Park Campus during the months of July and August. Each freshman will attend with a group of his future classmates. During the two days he will engage in the following:

1. Formal and informal discussions about University life and the standards of performance the University will expect of him.
2. A personal conference with a faculty adviser in his college who will assist him in selecting and registering for fall semester courses. (To assure the success of this conference, please have the SAT scores submitted to the University early in the spring.)
3. An introduction to campus facilities, sources of help for the problems the typical freshman must face, and out-of-class opportunities.
4. Payment of fall semester fees and charges and, if he so desires, purchase of his textbooks.

Through this program, the entering student receives a highly personalized and individual introduction to the University.

Transfer Student Orientation

Upon admission to the University, the transfer student receives information concerning an orientation program that is held during the summer. This program includes a conference with representatives of his college to explain academic requirements, as well as a general orientation to the campus itself. The program is particularly geared to the needs of upper class students and their special concerns.



Foreign Student Orientation

Foreign students admitted to the University are expected to attend the special orientation program arranged for them by the Director of Foreign Student Affairs. The September and February orientation programs are held the weekend prior to registration.

New Student Week

During Fall Registration Week students and faculty combine their efforts to plan a program to help students become acquainted with the many aspects of life at the University. The activities of this week range from open houses and picnics to study skills seminars and welcome assemblies. Faculty members participate in a series of programs designed to initiate the academic year. Entertaining social events are planned to help the student become acquainted with his future classmates. Student leaders show him how he can become involved in activities varying from intramural sports to student politics. Selected upperclassmen who compose the Fall Orientation Board are on hand to answer questions and lead small discussion groups.

For information about any of the orientation programs, please write: Orientation Director, Student Union, College Park, Maryland 20742.

Fees and Charges

The following table summarizes the fixed charges, mandatory fees, and room and full contract board charges for students enrolled in the undergraduate programs in the University of Maryland at College Park in 1969:

	<i>First Semester</i>	<i>Second Semester</i>	<i>Total</i>
<i>Maryland Residents</i>			
1. Not living in the University residence halls	\$298	\$208	\$506
2. Living in the University residence halls	\$748	\$658	\$1,406
<i>Residents of the District of Columbia, other States, and other Countries</i>			
1. Not living in the University residence halls	\$548	\$458	\$1,006
2. Living in the University residence halls	\$1,048	\$958	\$2,006

Full-time undergraduate students who register for the second semester, but who were not full-time undergraduate students in the first semester, are required to pay additional fees of \$45.

Special course fees, book costs, and personal expenses are not included.

All fees are due and payable in full at time of registration.

For complete information concerning fees, see Appendix A.

Grants and Scholarships

For promising young men and women who might not otherwise be able to attend the University, a number of grants and scholarships are available. New students must apply before March 15. Students already enrolled may apply before May 1. All requests for information concerning these awards should be directed to:

Director, Student Aid
University of Maryland
College Park, Maryland 20742

In deciding whether you are eligible to receive a grant or a scholarship, the Committee considers such qualifications as leadership, character, achievement, and participation in student activities, as well as academic ability and financial need. Recipients must register for a minimum of fourteen semester hours of credit per semester.

You should know of the major groupings of grants and scholarships. These are:

Full University Scholarships—Covering board, lodging, fixed charges, fees, and books.

University Grants—Awarded to deserving and qualified secondary school graduates. They cover fixed charges only.

General Assembly Grants—A few grants in varying amounts are available for appointment by each State Senator and each member of the House of Delegates.

Special Academic Scholarships—Awarded to students of exceptional academic ability.

Educational Opportunity Grants—Awarded to students of exceptional financial need from funds made available from the Federal Government. Awards range from \$200 to \$800 per year and must be matched by other institutional aid.

Endowed Scholarships and Grants—Supported by income from funds especially established for this purpose.

Teacher Remission of Fees—Residents of Maryland may have fixed charges remitted while pursuing successfully certain teacher preparation programs. Each applicant eligible to participate in the reimbursed program will be required to sign a pledge to teach in the public schools of Maryland for a period of two years, immediately following graduation. A reimbursement agreement must be signed to cover the contingency of not satisfying the teaching requirement. A more detailed explanation is available upon request. Persons enrolled in the summer session or in any of the late afternoon and evening programs are not covered by this fee remission program.

General State Tuition Scholarships—For fixed charges only, awarded by the State Scholarship Board on the basis of an examination.

See Appendix C for a more detailed listing of grants and scholarships.

Part-time Work Opportunities

A number of students are employed on a part-time basis by the University and others work in various capacities in shops and stores located in the College Park area. If the student seeks employment while pursuing a regular program of instruction, he should consult the Office of Student Aid which maintains a listing of available jobs within the University and in nearby commercial areas, including holiday and summer employment.

Are Loans Possible?

Several loans funds are available to meet educational expenses. Interest rates are low and repayment begins after the student leaves school. Financial need must be clearly established by providing a complete statement of the applicant's financial resources and expenses.

A more detailed description of the major loan funds is provided in Appendix C of this bulletin.

Air Force ROTC Program

The Department of Air Science operates the Air Force Reserve Officers' Training Corps program on an elective basis. The program provides college men with an opportunity to earn commissions in the United States Air Force while earning their degrees. The Air Force ROTC mission is to commission second lieutenants through a college program in response to Air Force requirements. Students should contact their college within the University to determine the number of AFROTC credits that may be applied toward their degree requirements.

Two Programs Offered

THE FOUR-YEAR PROGRAM

A General Military Course (GMC) is normally for freshmen and sophomores. Those who successfully complete the GMC may apply for the Professional Officer Course (POC) which is the final two years of AFROTC. Progression into the POC is not automatic but is limited to selected students only. Students in the four-year program must attend four weeks of field training at a designated Air Force base during the summer after completing the junior year of college. To enter the AFROTC program, one should inform his advisor and register for it in the same manner as for other courses. Only students who elect the four-year program are eligible to apply for AFROTC Financial Assistance Grants (scholarships).

THE TWO-YEAR PROGRAM

The Professional Officer Course (POC) is normally offered in the junior and senior years, but may be taken by graduate students otherwise qualified. This program is especially attractive for those unable to take the four-year program, particularly transfer students. Evaluation of candidates is normally begun during the first semester of the sophomore year, since each student must meet

physical and mental standards set by the Air Force. Interested students should contact the nearest Professor of Air Science as early in their sophomore year as possible. Students in the two-year program must attend six weeks of field training at a designated Air Force base during the summer preceding initial entry into the two-year academic portion. The academic program for the last two years (POC) is identical with the final two years of the four-year program. Cadets in the POC are exempt from the draft, since they are enlisted in the Air Force Reserve. This entitles them to all privileges afforded to military reservists.

The Curriculum

GENERAL MILITARY COURSE

Freshman Year, ARSC 11 and ARSC 12; Sophomore Year, ARSC 21 and ARSC 22. In the first two years, cadets meet academic classes once per week. In addition, they receive one hour of Corps Training each week.

PROFESSIONAL OFFICER COURSE

Junior Year, ARSC 101 and ARSC 102; Senior Year, ARSC 103 and ARSC 104. The courses for the junior and senior years are entitled "The Growth and Development of Aerospace Power", and "The Professional Officer", respectively. They require three class hours, plus one hour of Corps Training per week.

Financial Assistance for AFROTC Students

FINANCIAL ASSISTANCE GRANTS

This program provides Financial Assistance Grants (scholarships) for selected cadets each year in the four-year AFROTC program. Those selected receive money for tuition, fees, books, and laboratory expenses for up to six semesters. In addition, they receive non-taxable retainer pay of \$50 per month. One must be in the program at the University of Maryland before he can apply for a scholarship.

PAY

All POC members receive non-taxable retainer pay of \$50 per month.

AFROTC Flight Instruction Program

Qualified seniors who elect to become Air Force pilots receive a free 36½-hour flight instruction program. Cadets are instructed by competent civilian instructors. This training enables them to earn their private pilot's license before graduating from college.

Student Services and Activities

Health Services

The University recognizes its responsibility for safeguarding the health of its students. All new students, graduate and undergraduate, are required to submit a record of a current, thorough physical examination prior to their admission.

Foreign students must either present a satisfactory physical examination report form or be examined by the Health Services staff. A new, well-equipped and staffed health services facility is available for the treatment of full-time students.

In addition, commercial accident and sickness insurance, recommended by the University Student Insurance Committee, is available. This insurance is voluntary for domestic students; however, all foreign students are required to have this type of insurance in reasonable amounts.

Housing

By providing comfortable physical facilities and the services of professionally prepared staff, the University residence halls attempt to maintain an atmosphere of living that is conducive to intellectual, personal, and social development.

Since facilities are limited, students are assigned to the residence halls based on the distance from their home to the University, the date their housing applications are received by the University Housing Office or the date of payment of the \$50 enrollment deposit, whichever is later, and space availability. Only unmarried undergraduate students may live in the residence halls. Applications from students who will be 21 years of age or older at the time of registration, and who apply either for housing for the first time or for readmission to the University, are considered only after a personal interview. Those who room on the campus are also required to board on the campus. If the prospective student desires living accommodations in a residence hall, he should proceed as follows:

1. Apply for admission to the University. When the student is offered admission, he will be sent a Housing Application.
2. Submit the completed Housing Application to the University Housing Office, University of Maryland, College Park, Maryland 20742. He will then be sent information about: (a) room assignment priority, (b) conditions of residence hall contract, (c) University and residence hall rules and regulations, (d) room deposit, and (e) room furnishings.

Off-Campus Housing

Students may live off-campus if they so desire. The selection of an off-campus facility is the responsibility of the student and his parents or guardians.

An active file of off-campus rooms and houses is available on a self service basis to all persons associated with the University and is located in the Off-Campus Housing Office, Room 306, North Administration Building. The monthly rental for a person is about \$35.00 in a double room and about \$35.00-\$50.00 in a single room. The University does not assume responsibility nor any financial liability for the inspection, supervision, cleanliness, or operation of off-campus housing.

Married Student Housing

The University maintains a limited number of family housing units on the campus. Efficiency units for families with no children rent for \$42.50 per month and consist of a living room-bedroom combination, kitchen, and bath.

One-bedroom units are for families with only one child and rent for \$45.50 per month; no one-bedroom apartments are rented to couples only. These units are unfurnished but are equipped with an electric stove and refrigerator.

To be eligible, undergraduate students must take at least 15 credit hours per semester. Graduate students, other than those with teaching fellowships and assistantships, must take 10 hours credit per semester. A student must be officially admitted to the University before his application can be considered. Applications for the family units are available upon request by writing to the Director of Off-Campus Housing.

For the convenience of married students, the Off-Campus Housing Office maintains an active file of available off-campus rooms and houses. This file is available on a self-service basis and is located in Room 306, North Administration Building.

Counseling Center

The Counseling Center assists students interested in gaining a better understanding of themselves and resolving concerns of a vocational or educational nature. Both individual and group methods of counseling are used. Counseling interviews are confidential in nature. Where psychological testing is appropriate in the counseling of students, tests of ability, interest, and personality are administered.

Through its Reading and Study Skills Laboratory, the Center provides an extensive individualized program for students motivated to improve their reading and listening skills, study methods, vocabulary and spelling. Special workshops in writing skills and reading improvement are also offered.

The Counseling Center is a University-wide service available to all students. It is devoted to counseling of students, and is involved in research, teaching, and counselor training. The staff of the Center is composed of psychologists and educational specialists particularly trained to accomplish these purposes.

Full-time, undergraduate students are entitled to the services of the Center without charge.

The Counseling Center is located in the Shoemaker Building.

Student Union

The Student Union has much to offer the student and faculty in facilities and services.

The cafeteria, with seating for approximately 450, offers hot lunches from 11:00 a.m. to 2:00 p.m. and dinners from 4:45 p.m. to 7:30 p.m. The snack bar serves snacks from 7:00 a.m. to 9:30 p.m., in addition to breakfast and light lunches.

The Student Supply Store makes available for University personnel such classroom needs as texts and supplies, plus an assortment of clothing, cards, novelties and jewelry.

During out-of-class hours students enjoy functions and activities sponsored by the Student Union Board. These activities include an up-to-date and popular selection of films shown Friday through Sunday evenings in the air-conditioned ballroom and a selected number of classical films shown on Tuesdays. A Speakers Series brings many well-known personalities to the campus; the Spotlight Series brings favorite musical and comedy attractions. There are opportunities to

meet University faculty members during one of the monthly Student-Faculty Coffee Hours. Students examine the monthly art exhibit in the Fine Arts Lounge where student and faculty displays as well as the works of other well-known exhibitors are on view. Dances are sponsored twice monthly by the Student Union Board. These feature favorite bands and the dress is generally casual.

You may find relaxation on one of the Union's 16 automatic ten pin bowling lanes which are open from 9:00 a.m. to 11:00 p.m. daily, and slightly later on the weekends. Or perhaps you might enjoy a game of billiards in the 12 table billiard room. Facilities for chess and bridge are also available.

Personal checks up to \$10.00 may be cashed Monday through Friday from 9:00 a.m. to 3:00 p.m. in the main office for a small service charge. Student tickets for campus events are available in the Union ticket booth, located in the main lobby.

University-recognized organizations or clubs may meet in any of the many rooms of varying size; a reservation form should be completed in the Union office several days in advance. Light refreshments are available, but no food may be brought into the building.

The hours of operation listed here for any of the facilities of the Student Union are subject to change without notice depending on the needs of operating efficiency.

Student Organizations

Organized student activities are encouraged as aids in the development of leadership and citizenship skills. There are over three hundred officially recognized special interest clubs, civic groups, service organizations, professional organizations, recreational organizations, religious clubs, and musical clubs at College Park. A student may be interested in joining one of the many performing groups or the staff of one of the student publications. He may also be interested in affiliating with one of the social fraternities or sororities, in taking part in a resident hall dormitory government, in becoming a member of a club or society which has a primary interest in the informal investigation of an academic specialty, or in participating in Student Government Association activities.

The Music Department supports a number of performing ensembles, all of which are open to qualified students. These include the Symphony Band, Marching Band, Concert Band, and Varsity Band; the Chapel Choir, Chamber Chorus, Men's Glee Club, Women's Chorus, and Madrigal Singers; the University Orchestra, Brass Quartet, Clarinet Choir, and Woodwind Quintet; and the Opera Work Shop.

Six student communications and publications media are operated with faculty guidance and the general supervision of the Committee on Student Publications and Communications. They are: *The Diamondback*, the campus newspaper; *The Terrapin*, the student yearbook; *The M Book*, the student handbook; *Argus* and *Calvert Review*, campus literary magazines; and WMUC, the campus radio station.

Fraternities and sororities are social organizations which provide a small group experience in which close friendships are formed. They offer an opportunity for developing leadership abilities through workshop and actual experience, scholastic excellence and recognition by various awards, involvement in community affairs through a variety of philanthropic projects, personal growth

and maturity and a widespread variety of social experiences. Included among the events sponsored by fraternities and sororities are the Panhellenic Pledge Formal, Harmony Hall, Fall and Spring Greek Week, Inter-fraternity Council Ball, Interfraternity Sing, IFC Presents and many other events sponsored by individual chapters.

Religious clubs on campus include: The Baptist Student Union, Canterbury Association (Episcopal), Christian Fellowship (non-denominational), Christian Science, Diogenes Society (Unitarian), Ethos (Eastern Orthodox), Hillel Foundation (Jewish), Lutheran Student Association, Newman Club (Roman Catholic), Westminster Foundation (Presbyterian), and Wesley Foundation (Methodist).

The All-Faiths Memorial Chapel is one of the most beautiful structures of its kind in the nation. It houses the offices of chaplains, representing the denominational bodies; there are many opportunities for you to consult with the minister of your faith.

The Student Government Association represents all students under an approved constitution and by-laws. The Student Government Association has on its Cabinet four at-large members, the president and vice-president of the Residence Hall Council, the president of Inter-Fraternity Council, the president of Pan-hellenic Council, the president of the University Commuters Association, the president of Associated Women Students, the president of the Men's League, and the four class presidents. Other branches of the Student Government are the Legislature and the Student Courts, both making major contributions to the functioning of Student Government at the University.

Athletics and Recreation

The University recognizes the importance of the physical development of all students and, in addition to the required physical education for freshmen, sponsors a comprehensive intramural and intercollegiate program. Students are encouraged to participate in competitive athletics and to learn the skill of games that may be carried on after leaving college. The intramural pro-



gram, which covers a large variety of sports, is conducted by the Physical Education Department for both men and women.

The Council on Intercollegiate Athletics sponsors and supervises a full program of intercollegiate athletics. This program is an integral feature of University life. Each student is encouraged to participate in the program, either as an athlete or as a spectator. A strong intercollegiate program creates the incentives for participation in the intramural program and, further, the program furnishes a rallying point of common interest for students, alumni, and faculty.

The University is a member of the Atlantic Coast Conference, the National Collegiate Athletic Association, the United States Intercollegiate Lacrosse Association, and the Intercollegiate Amateur Athletic Association of America and cooperates with other national organizations in the promotion of amateur athletics.

The University has an activities building which contains a modern gymnasium, a swimming pool, training facilities for indoor sports, physical education laboratories, and an arena; also a large armory; a modern stadium with a running track; a number of athletic fields; tennis courts; golf course; baseball diamonds; and a gymnasium and swimming pool for women.

To Round Out Student Experiences

The Student Government Association's cultural committee, University Theatre, and musical groups present a broad program of musical, cultural and dramatic programs. Programs presented on the campus in 1967-68 by the SGA Cultural Committee were: Anna Moffo, Laurindo Almeida, Marcel Marceau, Bramwell Fletcher, First Chamber Dance Quarter, Julliard String Quartet, and the Dave Brubeck Quartet. The National Symphony presents a series of five concerts during the year. Contemporary entertainment is presented throughout the year by various student organizations.

University Theatre presented the following major productions: "Rhinoceros," "Barber of Seville," "Ah, Wilderness!" "How to Succeed in Business Without Really Trying" and "Romeo and Juliet."

The University entertainment series was rounded out on the lighter side with the presentation of Bob Hope, Serendipity Singers, The Fifth Dimension, and The Lettermen.

Campus or class-wide social events are associated with Homecoming, Spring Weekend, and the Freshman, Sophomore, Junior and Senior Proms. Name bands appear at these affairs.

Working with such community action programs as Volunteers for Mental Health, Newman Offers Witness, Hillel, Upward Bound, and the Denton-Cambridge Lincoln Heights projects offers an excellent opportunity to become involved directly with the solution of civic, economic, educational, political, and social problems of the present. P.A.C.E., People Active in Community Effort, is the organization at the University that serves as coordinator for short term and sustained volunteer community action projects. Through the P.A.C.E. office is provided such services as recruitment, orientation programs, leadership training programs, educational materials, supplies, community contacts and resources.

The Art Department sponsors an extensive series of lectures by eminent guest scholars and artists, as well as numerous exhibitions held in the Art Gallery of the J. Millard Tawes Building.

Academic Information

Scholarship and Leadership

Students who excel in scholarship and leadership may be invited to join the appropriate honor society. These include:

- | | |
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| *Alpha Kappa Delta (Sociology) | Phi Alpha Epsilon (Physical Education) |
| *Alpha Lambda Delta
(Scholarship-Freshmen Women) | *Phi Alpha Theta (History) |
| Alpha Sigma Lambda
(Adult Education) | Phi Beta Kappa
(Arts and Sciences) |
| Alpha Zeta (Agriculture) | Phi Delta Kappa (Education) |
| Beta Alpha Psi (Accounting) | *Phi Eta Sigma
(Scholarship—Freshmen Men) |
| Beta Gamma Sigma (Commerce) | *Phi Kappa Phi (Senior Scholarship) |
| *Chi Epsilon (Civil Engineering) | *Phi Sigma (Biology) |
| *Eta Kappa Nu
(Electrical Engineering) | Pi Alpha Xi (Floriculture) |
| Gamma Theta Upsilon (Geography) | Pi Mu Epsilon (Mathematics) |
| Iota Lambda Sigma
(Industrial Education) | *Pi Sigma Alpha (Political Science) |
| Kappa Delta Pi (Education) | *Pi Tau Sigma
(Mechanical Engineering) |
| *Mortar Board (Women's Scholarship
and Leadership) | *Psi Chi (Psychology) |
| *Omicron Delta Kappa (Men's
Scholarship and Leadership) | Sigma Alpha Eta (Speech Therapy) |
| Omicron Nu (Home Economics) | Sigma Alpha Iota (Women's Music) |
| | Sigma Alpha Omicron (Bacteriology) |
| | *Sigma Pi Sigma (Physics) |
| | *Tau Beta Pi (Engineering) |

* Members of Association of College Honor Societies.

The regulations governing minimum requirements for retention and graduation are printed in a separate publication, *University General and Academic Regulations*. Every student should familiarize himself with these regulations.

Honors Programs

The Colleges of Arts and Sciences, Education, Business and Public Administration, and Agriculture have created unusual opportunities for the superior student through the establishment of Honors Programs.

ARTS AND SCIENCES

The College of Arts and Sciences has instituted both General Honors and Departmental Honors. General Honors, as its name suggests, enlarges the breadth of the student's generalized knowledge; Departmental Honors increases the depth of his knowledge in his major discipline. Both offer the student challenging academic experiences characterized by small sections, active student participation, and an Honors faculty that encourages dialogue. Individually guided research and independent study are important features of Honors work.

Each year a selected group of entering freshmen are invited into the General Honors Program on the basis of their high school records and standardized test scores. The General Honors student, after acceptance, must maintain a "B" average to continue in the Program.

The Departmental Honors Programs ordinarily begin in the junior year, although a few programs begin as early as the freshman year.

By agreement, students in Secondary Education in the College of Education may participate in the Honors Programs of the College of Arts and Sciences.

The student who completes his Honors curriculum successfully is graduated with a citation in Honors.

Interested high school students should write to the Director of Honors, College of Arts and Sciences, University of Maryland, College Park, Maryland 20742.

BUSINESS AND PUBLIC ADMINISTRATION

The College of Business and Public Administration has instituted Departmental Honors Programs in Business Administration, Economics, and Government and Politics.

AGRICULTURE

The College of Agriculture has instituted a Departmental Honors Program in Agricultural Economics.

General Education Program

A college education implies something more than a technical training in a field of specialization. In order that each graduate may gain a liberal education as well as a specialized one, the University has established a General Education requirement. This requirement consists of 34 semester hours of credit in six areas: English (9 hours), Fine Arts or Philosophy (3 hours), History (6 hours), Mathematics (3 hours), Science (7 hours), and Social Science (6 hours). There is a wide choice in specific courses which may be used to satisfy requirements in all of the six areas except English.

The General Education Program is designed to be spread out over the four years of college. In each of the areas, courses for which no previous college course work is prerequisite are available; at the same time, alternative advanced courses are available in most of the areas. Thus a student may (within the limits of his particular curriculum) satisfy a General Education requirement with a variety of courses at different levels. Which courses he takes will depend on his ability—as determined by advanced credit, placement examination, department evaluation, and class standing—and upon his interests and needs.

It should be emphasized that the 34 semester hours of General Education courses constitute a minimum requirement, applicable to the undergraduate students in all of the colleges of the University of Maryland.

Physical Education and Health

The University is concerned with the physical fitness of each student. Therefore, all undergraduate men and women students registered for more

than eight hours of credit are required to enroll in and successfully complete two prescribed courses in Physical Education for a total of two semester hours of credit. A Health Education course of two semesters hours' credit is required of all undergraduate men and women, as well. These courses must be taken by all students taking more than 8 hours in a semester during their first year of attendance at the University whether they intend to graduate or not.

COLLEGE OF AGRICULTURE

The College of Agriculture offers a number of curriculums to prepare students for a wide variety of rewarding careers. These curriculums prepare the student for useful, informed citizenship with a basic understanding of science in general and the science of agriculture in particular. All four-year programs lead to the Bachelor of Science degree.

Modern agriculture is a highly complex and extremely efficient industry which includes supplies and services used in agricultural production, the production process itself, and the marketing, processing, and distribution of food and related products to meet the needs and wants of consumers.

Instruction in the College of Agriculture emphasizes the fundamental sciences and associated areas of knowledge that its graduates must use in the agriculture of the future. When necessary, course programs in specialized areas may be tailored to fit the needs of the student.

Previous training in agriculture is not a prerequisite for enrollment. Career opportunities for men and women with rural, suburban, or urban backgrounds are numerous in agriculture and its allied industries.

Graduates of the College of Agriculture have a broad base for rewarding careers and continued learning after college in business, production, teaching, research, extension and other professional fields.

Departmental honors program are available in Agricultural Economics and in Botany (in cooperation with the College of Arts and Science) to students who demonstrate the capacity for outstanding achievement.

FOUR-YEAR BACHELOR OF SCIENCE DEGREE PROGRAMS

Agricultural Chemistry	Botany
Agricultural Economics	Conservation and
Production Economics	Resource Development
Agricultural Business	Entomology
International Agriculture	Food Science
Agricultural and Extension	Dairy
Education	Fruits and Vegetables
Agricultural Engineering	Meats and Poultry
Agronomy	General Agriculture
Crops	Horticulture
Soils	Pomology
Animal Science	Olericulture
Dairy	Floriculture
Livestock	Horticultural Education
Poultry	

PRE-PROFESSIONAL PROGRAMS

VETERINARY SCIENCE. This program is designed for students desiring to prepare for the professional course in veterinary medicine. A combined degree is available to students in pre-veterinary science. A student who has completed 90 academic semester credits at the University of Maryland and who has completed successfully a program of 30 additional academic semester credits at the University of Georgia or at any accredited veterinary school is eligible to make application for the Bachelor of Science degree from the University of Maryland.

FORESTRY. This program is designed for students who may want to pursue two years of basic study in preparation for transfer to a standard forestry curriculum in another institution.

TWO-YEAR TERMINAL PROGRAM

INSTITUTE OF APPLIED AGRICULTURE. A two-year program in agriculture is offered for students who wish to spend only a limited time beyond high school to prepare for a specialized occupation. Courses are offered at less than the baccalaureate level. Students interested in this program should write to the Institute of Applied Agriculture, University of Maryland, College Park, Maryland 20742.

RECOMMENDED PREPARATION IN HIGH SCHOOL

English	4 units
Mathematics (College Preparatory)	2 units
(Algebra 1 unit and Plane Geometry 1 unit—Agricultural Chemistry requires 2 additional units)	
Biological and Physical Sciences	3 units
History and Social Sciences	2 units

Two units of foreign language are recommended for students planning to major in Agricultural Engineering, Agricultural Chemistry, Botany and Entomology.

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English
Social Science or Mathematics
Agriculture
Botany
Agriculture Elective
Physical Education

SECOND SEMESTER

English
Mathematics
Health
Zoology
Agriculture Elective
Physical Education

COLLEGE OF ARTS AND SCIENCES

Within the College of Arts and Sciences students can obtain both a liberal education, in which ideas are cultivated and enjoyed for their own sake, and a more concentrated education, which falls within one or more of the basic disci-

plines and which points toward a career. The College seeks to develop graduates who can deal intelligently with problems. It tries to provide for its students a general education which will be a continuing source not only of material well-being but of genuine personal satisfaction.

The areas of concentration available within the College lead to the degrees of Bachelor of Arts and of Bachelor of Science.

Areas of concentration leading to the degree of Bachelor of Arts are in the arts, the humanities, and the social sciences.

Concentration in these areas is the normal preparation for the student who plans to go to law school; to a post-graduate or professional school of business administration, library science, or social service; or to a theological seminary.

The student interested in research (university, government, business and industry) or in college teaching in these areas of concentration will find here the undergraduate preparation necessary for the graduate work required by these careers.

By including the appropriate courses in education, a student in some of these areas can qualify for public school teaching. For students interested in foreign service, the foreign area programs combine intensive study of a language with study of the civilization of the area. Other careers in government and business are open to the student in the College of Arts and Sciences who selects appropriate areas of specialization.

Specialized programs are also offered in the fine arts (art, dance, drama, music) and in speech therapy.

Areas of concentration leading to the degree of Bachelor of Science are in the physical sciences, the biological sciences, and mathematics.

Concentration in these areas prepares the student for specialized positions in industry and government. He can also gain the preparation necessary for admission to the professional schools of medicine and dentistry or for admission to graduate work leading to advanced degrees in Mathematics, Chemistry, Physics, and the Biological Sciences. Research (industry, government, university) and college teaching are among the possibilities open to the student who successfully completes an undergraduate and graduate program in mathematics or one of the basic sciences.

BACHELOR OF ARTS

FOUR YEAR BACHELOR OF ARTS DEGREE PROGRAMS

American Studies	German, Russian, Spanish)
Anthropology	French
Art*	Geography†
Comparative Literature	German
Dance	Government and Politics†
Economics†	Greek
English	History
Foreign Area Studies (French,	Latin

*Also available are a degree in Art Education offered by the College of Education, and a program in Practical Art offered by the College of Home Economics.

†Programs in these fields are also offered in the college of Business and Public Administration.

Music (see also Bachelor of
Music degree)
Philosophy
Psychology
Russian

Sociology (including a program
in Criminology)
Spanish
Speech (including also programs in
Dramatic Art, Radio-T.V., and
Speech Therapy)

RECOMMENDED PREPARATION IN HIGH SCHOOL

English	4 units
Mathematics	3 or 4 units of College Preparatory Mathematics
Biological and Physical Science	1 or more units
History and Social Sciences.....	1 or more units
Foreign Languages and Latin.....	2 or more units

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

Typical program for the freshman year for students following a program leading to the Bachelor of Arts degree:

FIRST SEMESTER

English
Science or Mathematics
Foreign Language
Fine Arts or Philosophy
Physical Activities
Health

SECOND SEMESTER

Public Speaking
Science or Mathematics
Foreign Language
Social Science
Elective
Physical Activities

PRE-LAW. A three-year program, followed by three years of Law at the University of Maryland Law School, leads to the B.A. and LL.B. degrees. Pre-law students may also follow any of the four-year programs and earn the Bachelor of Arts degree before entering law school.

BACHELOR OF MUSIC. Four-year program leading to the Bachelor of Music degree. Professional training in theory-composition, history-literature, and applied music (voice or instrument).

BACHELOR OF SCIENCE

FOUR YEAR BACHELOR OF SCIENCE DEGREE PROGRAMS

Astronomy	Physics
Botany*	Psychology
Chemistry	Zoology
Mathematics	General Biological Sciences
Microbiology	General Physical Sciences

RECOMMENDED PREPARATION IN HIGH SCHOOL

English.....	4 units
Mathematics.....	4 units of College Preparatory Mathematics
Biological and Physical Sciences.....	1 or more units, including Chemistry and Physics, if possible
History and Social Sciences.....	1 or more units
Foreign Languages and Latin.....	2 or more units

*A curriculum in Botany is also offered in the College of Agriculture.

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

Public Speaking
 Mathematics
 Sciences (one or more of the
 introductory courses)
 Social Science
 Health
 Physical Activities

SECOND SEMESTER

English
 Mathematics
 Sciences (continued)
 American Government or Elective
 Public Speaking
 Physical Activities

PRE-MEDICAL AND PRE-DENTAL PROGRAMS. There are three-year programs meeting minimum requirements for medical school or dental school. A four-year program in any of the major fields in the College of Arts and Sciences leading to a B. A. or B. S. degree can prepare a student for professional schools. Only exceptionally mature students with consistently high academic records should consider the three-year pre-medical curriculum.

The freshman program shown below for pre-medical and pre-dental students is typical both of the four-year and of the three-year programs.

FIRST SEMESTER

Philosophy or Public Speaking
 Mathematics
 Chemistry
 Zoology
 Health
 Physical Activities

SECOND SEMESTER

English
 Mathematics
 Chemistry
 Zoology
 Physical Activities



COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

Four-year programs leading to the Bachelor of Science Degree are offered by the College of Business and Public Administration. Students may complete the four-year program in a shorter period of time by attending summer sessions. They may choose their programs of study from the offerings of the following departments: Department of Business Administration, Department of Economics, Department of Geography, Department of Government and Politics, Department of Information Systems Management and Department of Journalism.

Before concentrating in any of the College's special fields of study, all students follow during their first two years an educational program that provides a foundation upon which to base advanced work in the management or social sciences or in journalism. The first two years constitute, therefore, a major part of the general education that the University offers and an opportunity to learn something of the nature of different professional and scholarly fields.

DEPARTMENTAL PROGRAMS OF STUDY

BUSINESS ADMINISTRATION. Programs: General Programs in Business Administration; Accounting; Finance; Marketing; Personnel & Industrial Relations; Production Management; Statistics; Transportation.

Upon completion of requirements for the degree, students following any of these programs will have had the advantage of a broad general education, a firm understanding of the internal characteristics and external relationships of business and a professional training focused upon one of the major lines of managerial activity.

All students in business administration follow the same course of study for the first two years. In addition to the general requirements cited above, students take courses in speech, business enterprise, and accounting during the freshman-sophomore years. The junior-senior years are devoted to the requirements of the major plus such complementary courses as are deemed desirable for the completion of a sound general education. An honors program is available to students who demonstrate the capacity for outstanding achievement.

Students who major in one of the areas of business administration often enter business or government immediately after graduation, but their undergraduate programs also prepare them for graduate study in business.

ECONOMICS. Students wishing to major in economics and to earn the degree of Bachelor of Science may register in the College of Business and Public Administration, the College of which the Department of Economics is administratively a part. (Under a slightly different set of requirements, students may major in economics in the College of Arts and Sciences.) The first two years are devoted to the general requirements plus an additional course in economics and electives. The junior-senior years are devoted to the requirements of the major, and to elective courses. An honors program in economics is available to students who demonstrate the capacity for outstanding achievement.

Students majoring in economics may look forward to careers in business

and government and, after graduate study, to college teaching and to research in many different types of organization.

GEOGRAPHY. Geography offers programs of study for students in the College of Business and Public Administration and in the College of Arts and Sciences and provides a content field for students majoring in Secondary Education in the College of Education.

During the first two years, in addition to satisfying general university and college requirements, majors complete a basic "core" of four courses that is prerequisite to upper-division work. At the upper division level the major program is flexible and can be designed to fit the individual student's interest. Several established specializations attract numbers of students.

Students specializing in physical and cultural geography usually enter teaching or federal governmental employment; those specializing in urban geography also find employment in local, state, and private planning agencies; and students emphasizing cartographic techniques work for both governmental and private mapping units. After a successful undergraduate program in any of these areas, the student may enter upon graduate study in preparation for teaching, research or professional work in public or private organizations.

GOVERNMENT AND POLITICS. Programs: General Program in Government and Politics; International Affairs; and Public Administration.

Three programs of study are offered by the Department of Government and Politics to students in the College of Business and Public Administration: (1) a general program in government and politics, (2) a program in international affairs, and (3) a program in public administration. (Under a slightly different set of requirements the general program and the international affairs program are offered also to students in the College of Arts and Sciences. The public administration program is available only in the College of Business and Public Administration.) In all three programs, the first two years are devoted to the general requirements, along with additional courses in government and politics and elective courses. All students are required to complete at least 12 hours of a foreign language. Majors may concentrate in the general program, in international affairs, or in public administration. The junior-senior years are devoted to the advanced government and politics courses and to courses considered complementary to a particular program. An honors program is available to students who demonstrate the capacity for outstanding achievement. Graduates enter upon careers in local, state and national governments or international organizations and, especially after graduate studies, in teaching.

INFORMATION SYSTEMS MANAGEMENT. This department offers a program conceived to meet the needs of the rapidly expanding area of information technology as related to business and public administration and to the areas of social science offered as a part of the College curriculum. In addition to the general requirements previously outlined, the program requires a second year of college mathematics. Supporting courses in accounting and in statistics are required. Courses in integrated data processing and in other aspects of computer utilization are features of the program.

Industry and government offer an increasing number and variety of opportunities to graduates of college programs in this new field.

JOURNALISM. Students aspiring to become reporters, commentators, editors and publishers may follow the program in journalism. Opportunity is also provided to prepare for careers in the advertising aspects of journalism, as well as in photo-journalism, public relations and radio-television.

Students pursuing a major in this department devote the first two years to meeting the general requirements, along with 3 hours of journalism and certain electives. The junior-senior years are devoted to advanced journalism courses and to courses complementary to this area of study.

THE PRE-LAW PROGRAM. Students completing the requirement for the B.S. degree with a major in any of the various departments of the College may apply for admission to the University of Maryland Law School or to law schools located elsewhere. Certain well qualified students majoring in general business may, upon completion of 90 semester hours of work approved by the College, apply for admission to the University of Maryland Law School. Upon successful completion of one year of law school, they are awarded the B.S. degree. With the completion of two additional years of law, they receive the Bachelor of Laws degree. All students are generally advised, however, to complete the B.S. degree before entering the law school.

RECOMMENDED PREPARATION IN HIGH SCHOOL

Students expecting to enroll in the College of Business and Public Administration at the University of Maryland should pursue the pre-college program in high school. Those who follow the commercial studies curriculum in high school are usually not prepared to meet the requirements of the College. The College recommends the following preparation in high school:

English.....	4 units.
Mathematics.....	3 or more units of College Preparatory Mathematics; including a minimum of 2 units of Algebra and 1 of Geometry.
History and Social Sciences.....	1 or more units.
Natural Science.....	2 or more units.
Foreign Languages.....	2 or more units.

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English
Mathematics
Economics
Fine Arts
Social Science or Language
Health
Physical Education

SECOND SEMESTER

English
Mathematics
Business Administration or Social Science
Natural Science
Language or Speech
Physical Education

ADDITIONAL INFORMATION

High school counselors and others desiring more specific information on the programs of the College of Business and Public Administration are invited to direct queries to the Assistant Dean, College of Business and Public Administration, University of Maryland, College Park, Maryland 20742.

COLLEGE OF EDUCATION

The College of Education offers a four year program leading to a Bachelor of Arts or a Bachelor of Science degree for: (1) persons preparing to teach in secondary schools, elementary schools, kindergarten and nursery school, (2) persons preparing to teach classes in special education and to be school librarians and, (3) students preparing for educational work in the trades and industries. The specific programs are:

SECONDARY SCHOOL TEACHING: Art, English, foreign languages, mathematics, social sciences, speech, industrial arts, vocational-industrial education, music, home economics, business, physical education (in co-operation with the College of Physical Education, Health and Recreation).

ELEMENTARY SCHOOL TEACHING: Early Childhood (nursery, kindergarten, and primary grades), Elementary (grades 1-6), art, music, physical education (in co-operation with the College of Physical Education, Health and Recreation).

SPECIAL EDUCATION

LIBRARY SCIENCE EDUCATION

EDUCATION FOR INDUSTRY (A non-teacher program)

RECOMMENDED PREPARATION IN HIGH SCHOOL

Students planning to enter the College of Education should enroll in the academic program in high school. The greatest amount of flexibility is assured by taking additional units in mathematics, natural science, social science and foreign language. Other electives in the fine arts, trade, and vocational subjects are acceptable. The units recommended for admission are as follows:

English	4
Mathematics	2 <i>or more</i>
History and Social Science.....	2
Natural Science	2
Foreign Language	2
Electives	4

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English
Art or Music
Mathematics or Science
Social Science
Physical Education
Elective or Language

SECOND SEMESTER

Social Science
Science
Speech
Elective or Language
Physical Education
Health

SPECIAL FEATURES

The curriculum laboratory provides students with both materials and assistance in the area of curriculum. An up-to-date collection of curriculum materials is maintained. This includes texts, courses of study, study guides, curriculum studies, and bibliographies. The laboratory is equipped to assist students and student teachers with preparation of teaching plans.

The Educational Technology Center serves as a service facility by providing teaching aids of all kinds, audio-visual equipment and service, and instruction in all aspects of instructional materials, aids and new media.

A nursery school and kindergarten is operated on campus in which students majoring in Early Childhood Education receive training and practical experience.

The National Science Teaching Center is located in the college and maintains a collection of science teaching materials which includes textbooks, films, film strips, pamphlets, apparatus and equipment for students, teachers, and supervisors. The center serves as a depository for courses of study and other materials for grades K-16 in science.

The College of Education sponsors professional organizations: Phi Delta Kappa, the national professional fraternity for men in Education; Iota Lambda Sigma, the national honorary fraternity in industrial education; a chapter of the National Honorary Society, Kappa Delta Pi; a chapter of the Student National Education Association; a student chapter of the Council for Exceptional Children open to students preparing to work with exceptional children; the student American Arts Association; a local chapter of the American Society of Tool and Manufacturing Engineers; and a chapter of the Music Educators National Conference. Several graduate student organizations have been formed within college departments.

Eligible students in the College of Education who plan to prepare for secondary school teaching may participate in the Honors Program.

COLLEGE OF ENGINEERING

Glenn L. Martin Institute of Technology

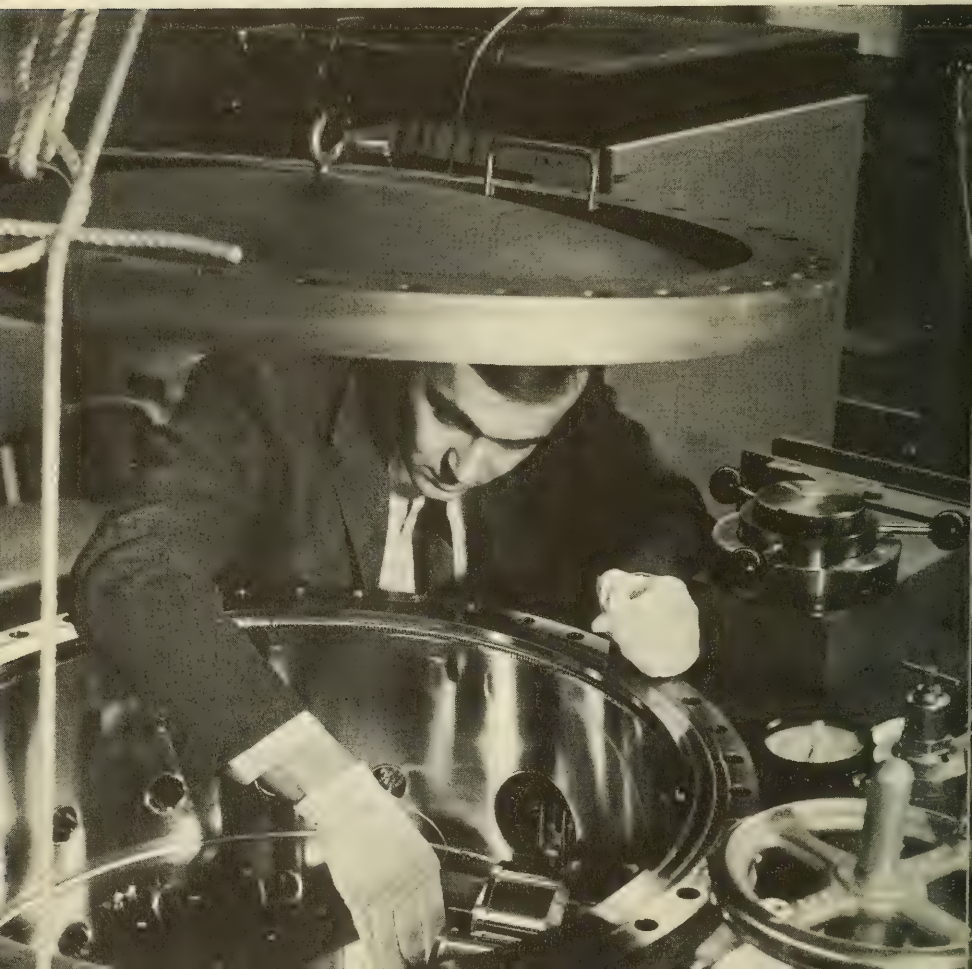
The College of Engineering offers four-year programs leading to a Bachelor of Science degree in aerospace, chemical, civil, electrical and mechanical engineering, and in fire protection. Each program integrates these elements: (1) BASIC SCIENCE including mathematics, physics and chemistry; (2) ENGINEERING SCIENCE including mechanics of solids and fluids, engineering materials, thermodynamics, electricity and magnetism; (3) PROFESSIONAL STUDIES in aerospace, chemical, civil, electrical or mechanical engineering, or in fire protection; (4) GENERAL EDUCATION COURSES including English, history, fine arts or philosophy, and the social sciences; (5) OTHER REQUIRED SUBJECTS including health and physical activities. Each program lays a broad base for *continued learning* after college in professional practice, business or industry, public service, or graduate study and research.

The following is representative of work performed by engineering graduates.

THE AEROSPACE ENGINEER deals with problems related to transporting people and things by aircraft through space. Aerodynamics, thermodynamics, and the mechanics of fluids and solids are among his engineering sciences. He may apply them in some phase of planning or producing airplanes, missiles or rockets, and in devising means to sustain and control their flight.

THE CHEMICAL ENGINEER applies chemistry to the development and economic production of industrial chemicals, fuels, modern synthetics and certain alloys. He also applies mechanics, thermodynamics, reaction kinetics and aspects of nuclear science to unit operations and processes which are fundamental in the design and operation of the chemical industries.

THE CIVIL ENGINEER is primarily a planner, designer, builder, and manager of public works and private enterprise. His professional service plays a major role in designing, supervising construction, and managing virtually every large building, bridge, dam, highway, railway, airport, water supply, waste disposal system, city plan, industrial plant, public works project.



THE ELECTRICAL ENGINEER puts mathematics, physical science and engineering science to practical use in designing systems to generate, transmit, distribute, and use electrical energy. He deals with problems related to the transmission and reception of "intelligence," as for example by telephone, radio, radar, television and computers, as well as the regulation and control of mechanical and industrial processes by electronics and servomechanisms.

THE MECHANICAL ENGINEER figures ways to generate and transmit power economically by heat or mechanical systems. He applies the mechanics of fluids and solids, thermodynamics, and an understanding of the behavior of engineering materials under different conditions. As a professional engineer he devises processes for industrial production. As an industrial agent he serves as a supervisor, manager, or sales representative.

The Fire Protection graduate is concerned with the scientific and technical problems of preventing loss of life and property by fire, explosion, and related hazards. His academic training prepares him to serve industry, public agencies, and insurance companies professionally.

RECOMMENDED PREPARATION IN HIGH SCHOOL

If you wish to become a *professional engineer* you should take the college preparatory curriculum in high school. Subjects that are recommended for admission total sixteen units as follows:

English	4
Mathematics (college preparatory)	4
History and Social sciences	2
Physical sciences (Chemistry and Physics)	2
Foreign Language—(German, French or Russian)	2
Other academic subjects	2

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

All engineering students enroll in essentially the same subjects during their first year in college as follows:

FIRST SEMESTER

Calculus and Analytical Geometry
General Chemistry
Engineering Graphics
General Education Course*
Physical Activities
Health

SECOND SEMESTER

Calculus and Analytical Geometry
General Chemistry
Physics
Mechanics
General Education Course*
Physical Education

Each student in the College of Engineering will select his major-line department—aerospace, chemical, civil, electrical, or mechanical engineering, or fire protection—before he begins his sophomore year's work. Thereafter he will pursue the approved program of his department which leads to the bachelor's degree.

*Selected from English composition or Literature, Government and Politics, Sociology, Psychology, Anthropology, Art, Dance, Music, Speech, or Philosophy.



COLLEGE OF HOME ECONOMICS

The primary function of Home Economics is to relate the contributions of the physical, biological, and social sciences and art in the approach to the study of all phases of home and family life as applicable to individual families and to agencies serving families.

The educational program of the College of Home Economics is planned to help students function effectively as individuals, as family members, and as responsible citizens and to prepare men and women for positions for which home economics is a major or minor preparation. Entering freshmen may enroll without specifying a major area; however, a choice must be made by the beginning of the fourth semester.

Graduates of the College are prepared to enter one of three broad areas of employment: educational-community-family life, technical, and commercial consumer service. The various programs of study have certain common courses with possible options and electives to meet needs of students. The major curricula include: general and family life; home economics education and extension; food, nutrition, and institution administration; housing and applied design; and textiles and clothing.

GENERAL AND FAMILY LIFE. This program enables a student to build a broad background as well as a specialized emphasis in the areas related to both professional and personal aspects of Home Economics. Careers in family service agencies and consumer education, in addition to personal, family, and community living, are the foci of students in this program.

EDUCATION AND EXTENSION. This program is designed for students who are preparing to teach home and family living or to become home economics extension agents. Both programs include study in all phases of home economics and the allied sciences along with specified professional training.

FOOD, NUTRITION, AND INSTITUTION ADMINISTRATION. Students learn the scientific principles underlying food selection, purchase, preparation, and service for home and institution use. Food and nutrition are applied sciences; therefore, courses in chemistry, physiology, microbiology, psychology, and economics are essential to their understanding. Graduates in this area are employed in consumer education departments of business firms, communication areas, and state or community programs. Opportunities in food service include hospitals, schools and colleges, and commercial institutions.

HOUSING AND APPLIED DESIGN. This program permits a choice from four areas of specialization: art in advertising, in housing and interior design, fashion design and crafts. A major in this area provides background for employment in advertising and in the designing and merchandising of fashion and home furnishings.

TEXTILES AND CLOTHING. These curricula promote understanding of textiles, fashion, and clothing design and construction in relation to technological and social developments influencing consumer choices. Graduates have positions in merchandising, fashion design and promotion, textile testing, and research.

RECOMMENDED PREPARATION IN HIGH SCHOOL

English	4
Mathematics (college preparatory).....	3
History and Social sciences.....	2
Biological and physical sciences.....	2
Foreign language and other academic subjects.....	4

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English Composition and Literature
 Introduction to Family Living
 Applied Design
 Mathematics
 Science or Elective
 Health
 Physical Activities

SECOND SEMESTER

Sociology of American Life
 Textiles and Clothing
 Food and Nutrition
 Speech
 Science or Elective
 Physical Activities

COLLEGE OF PHYSICAL EDUCATION, RECREATION, AND HEALTH

The College of Physical Education, Recreation, and Health provides preparation leading to the Bachelor of Science degree in the following professional areas: physical education, health education and recreation. The College also offers special curricula in safety education and elementary physical education.

A one year required program of physical education and a one semester required health education program are provided by this College for all freshmen. The College provides an extensive intramural sports program for both men and women.

Four year programs leading to the Bachelor of Science degrees:

PHYSICAL EDUCATION. The curriculum provides a background in general education and the scientific areas closely related to this field. Development of skills in a wide range of motor activities is emphasized. Many vocational opportunities are available in public and private schools, organized camping groups and organizations which offer a program of physical activity.

HEALTH EDUCATION. A healthy nation is not primarily the responsibility of physicians and druggists, but of the people themselves. This means that people need to know how to live healthfully and to utilize available health facilities—that is, they all need to be educated in basic health principles. Persons qualified to teach health are needed in schools, colleges, community health agencies and hospitals. Students interested in qualifying for supervisory or college-level positions are encouraged to plan on doing graduate work either in school health or public health education.

RECREATION. This curriculum is designed to meet the needs of students who wish to qualify for the many positions in the field of recreation, and the needs of those students who desire a background of culture and skills which will

enable them to render distinct contributions to community life. Courses in various skill areas (music, nature and camping, etc.) and those in the major field (program planning, organization and administration, etc.) prepare the student both for his field work experience (senior practicum) and for his future employment in public and private departments and agencies, in industry, with the armed forces, in hospitals and institutions, etc.

RECOMMENDED PREPARATION IN HIGH SCHOOL

Students should enroll in the college preparatory program in high school. The following subjects are recommended:

English	4 units
Mathematics (college preparatory)	3 units
Social Sciences	2 units
Biological Science	1 unit
Chemistry	1 unit
Physics	1 unit
Other academic subjects	4 units

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English
Mathematics
Professional courses
Science
Speech
Elective

SECOND SEMESTER

Social Science
Professional courses
Science
Health
Elective

UNIVERSITY COLLEGE

University College subscribes to the philosophy that continuing education is essential to meet the demands of today's complex society. Thus, the College, in contrast to the usual practice of bringing students to the University, makes educational opportunities available to adult students at hours and locations convenient for them.

As a result of this philosophy, most University College courses are given in the evening. Therefore, the average undergraduate—that is, a person who wishes to be a full-time day-school student—would have little reason to enroll with University College. Nor would he be allowed to do so, except in special cases. However, if a student who first enrolls as a full-time day-school student later finds it necessary to take a day-time job, he may then take evening courses with University College. The following information may, therefore, be useful.

Specifically, University College has a three-fold purpose: (1) to extend the program of the University by offering college-credit evening courses for adults on campus and off campus throughout the State, in the District of Columbia, and at various overseas centers; (2) to offer the Bachelor of Arts degree in General Studies to qualified adult students; and (3) through the

Conferences and Institutes Division, to arrange special programs to meet specific non-credit educational needs of varying adult groups.

The General Studies curriculum provides opportunities for programs in the humanities, the social sciences, and business administration, with concentrations in such fields as commerce, English, government and politics, history, philosophy, psychology, and sociology.

Off-campus centers in Maryland and the District of Columbia at which courses in these fields are offered include:

Aberdeen Proving Ground	Fort Meade	Naval Research Laboratory
Andrews Air Force Base	Fort Ritchie	Patuxent Naval Air Station
Baltimore Campuses	Maryland Penitentiary	Pentagon
Bainbridge Naval	Montgomery County Police	Prince Georges County Police
Training Center	National Bureau of Standards	Soc. Security Bldg.—Baltimore
Bolling Air Force Base	National Institute of Health	Tolchester Missile Site
D.C. Recreation Dept.	National Security Agency	Walter Reed Army
Edgewood Arsenal	Naval Ordnance Laboratory	Medical Center

In addition, the Off-Campus Division of University College offers courses for teachers in most of the counties in Maryland. The College Park Evening Division offers courses on campus.

Overseas, University College courses are offered to military personnel and their dependents, and to certain civilians, in twenty-five foreign countries on four continents. These courses are offered in cooperation with the U. S. Armed Forces.

To enroll in University College, students who have never attended a college or university must have either an acceptable high school diploma or the high school equivalent; students who have attended another college or university must be in good academic standing. Further information about admission requirements may be obtained from a University College adviser (call 454-2311 for an appointment) or from the University College catalog, which may be obtained by writing to the Dean, University College, University of Maryland, College Park, Maryland 20742.

The College does not offer correspondence courses.

SCHOOL OF ARCHITECTURE

The broadened involvement of architects in all aspects of environmental design and developmental change together with the increasing urbanization of our society has generated a need for many more people educated to deal with, and assist in resolving, the urgent urban problems besetting our society.

In response to this need, the School of Architecture of the University of Maryland was founded with the enrollment of its first class of freshmen students in September, 1967. A five-year professional program leading to the Bachelor of Architecture Degree will be developed as this first class moves forward. In addition to professional courses, the planned curriculum provides a general education in the humanities and natural and physical sciences. Professional work includes courses in architectural history, environmental design, and building systems, as well as a wide range of professional electives.

In general the program of studies moves from a beginning emphasis on the humanities to an emphasis on professional subject matter.

RECOMMENDED HIGH SCHOOL PREPARATION

High School preparation should include the following: English—4 units; college preparatory mathematics including algebra, plane geometry, trigonometry, and other more advanced courses when offered—3 to 4 units; foreign language—2 or more units; biology, chemistry or physics—2 units; history and social science—1 or more units.

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

Anthropology (3)	History of Modern
Sociology or Psychology (3)	Environmental Design (6)
Mathematics (7)	Physical Education (2)
English (6)	Health (2)
History (6)	

Admissions

Students may enter the program directly from high school or after one year of general college work. **ADMISSION TO THE SCHOOL IS COMPETITIVE WITH SELECTION BASED ON PREVIOUS ACADEMIC ACHIEVEMENT.**

Inquiries should be addressed to:

Dean, The School of Architecture
University of Maryland
College Park, Maryland 20742



THE SCHOOL OF MEDICINE PHYSICAL THERAPY CURRICULUM

Physical Therapy is a health profession concerned with the prevention, evaluation and treatment of disease processes and injuries amenable to the effects of certain physical agents (heat, cold, ultrasound, light, electricity, water, massage), exercise and functional training. Evaluation and therapy is performed with due consideration for the emotional, social and economic factors related to the individual's health maintenance or recovery. Its purposes are effected through individual treatment or group instruction or by consultation and instruction of others concerned with patient care. Physical Therapy is administered only when the patient is referred by a physician.

The University of Maryland offers a 4-year curriculum to men and women students leading to a Bachelor of Science Degree after the completion of 139 semester hour credits (63 liberal arts and sciences, 72 professional, and 4 health and physical activities). The freshmen and sophomore students are registered on the College Park or Baltimore County Campus and the junior and senior students on the Baltimore City Campus. Qualified students from other accredited universities or colleges who have successfully completed appropriate courses may be admitted directly to the professional program at Baltimore.

RECOMMENDED PREPARATION IN HIGH SCHOOL

Students should enroll in the college preparatory program in high school. The following subjects are recommended:

English	4 units
Mathematics (college preparatory)	3 units
Social Sciences	2 units
Biological Science	1 unit
Chemistry	1 unit
Other academic subjects	4 units
Physics	1 unit

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

English
Chemistry
Mathematics
Sociology
Physical Therapy Orientation
Physical Activities
Health

SECOND SEMESTER

Philosophy or Fine Arts
Speech
Chemistry
Chemistry
Mathematics
Psychology
Physical Therapy Orientation
Physical Activities

For further information write to the Department of Physical Therapy, School of Medicine, 520R West Lombard Street, Baltimore, Maryland 21201.

THE SCHOOL OF NURSING

Nursing is one of the health professions which offers a wide range of career opportunities to young women and men. These include employment in hospitals, in other community health services, in industry, and in the military service of the United States.

College preparation in nursing provides a broad base for continued learning throughout a lifetime of professional practice. It also serves as a foundation for graduate study through which professional nurses prepare for specialized fields and for leadership positions.

DEPARTMENTAL PROGRAMS OF STUDY

The School of Nursing offers a four-year program to students who wish to prepare for professional nursing. The first two years are spent on the College Park or Baltimore County Campuses where the student pursues a program geared to providing fundamentals of a liberal education plus subjects which are foundational to study in nursing. It is possible for students to transfer from other accredited colleges at the end of the first or second academic year.

The junior and senior years are devoted to completing the nursing major, related courses, and electives. All clinical course work is under the direct supervision of School of Nursing faculty whether it takes place at University Hospital, at the Walter Reed General Hospital, or at any of the other hospital or community facilities used for instruction of nursing students.



Registered nurses who desire to bring their previous preparation in nursing in line with requirements for the baccalaureate degree should write the Office of the Dean, School of Nursing, University of Maryland, Baltimore, Maryland 21201. Registered nurse students follow a program plan set by a nursing advisor which includes both academic and clinical courses. A typical program includes general courses taken at College Park, Baltimore County, or University College plus clinical and certain other courses in Baltimore.

RECOMMENDED HIGH SCHOOL PREPARATION

Students who wish to prepare for a career in professional nursing should enroll for an academic program in high school. Subjects recommended for an admission total of no fewer than 16 units should include the following:

- English..... 4 units
- Mathematics..... 2 or 3 units
- History and Sciences..... 2 units
- Foreign Language..... 2 or more units
- Science..... 3 units (including 1 unit of Physics, 1 unit of Biology and 1 unit of Chemistry)

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

- English
- Sociology
- Mathematics
- Chemistry
- Speech
- Nursing
- Physical Activities

SECOND SEMESTER

- Chemistry
- Zoology
- Psychology
- Fine Arts or
- Philosophy
- Health
- Physical Activities

Special Features

Through a contractual arrangement between the University of Maryland School of Nursing and the United States Government, the facilities of the School of Nursing, University of Maryland, have been extended to include the Walter Reed Army Medical Center and certain other nearby military bases. These clinical facilities are utilized by the faculty of the School of Nursing to provide learning experiences for those students who have been subsidized through the United States Army and who, following graduation, are obligated to serve for three years in the Army Nurse Corps. Applicants can secure further information from high school counselors, from Army Recruiting Stations, or from the University of Maryland.

For further information write to:

The Dean
School of Nursing
University of Maryland
624 W. Lombard Street
Baltimore, Maryland 21201

THE SCHOOL OF PHARMACY

The five-year curriculum at the University of Maryland leading to the degree of Bachelor of Science in Pharmacy consist of two years of pre-professional training available at the College Park and the Baltimore County Campuses and three years of professional training offered on the Baltimore City Campus. Qualified students from other accredited universities or colleges who have successfully completed appropriate courses may be admitted directly to the professional program at Baltimore.

The educational program of the School of Pharmacy is designed to prepare young men and women for the efficient, ethical practice of pharmacy; to instruct students in cultural and scientific subjects, as well as in administrative and managerial methods, for the orderly development of productive members of a profession and of qualified citizens in a democracy; and to guide students into productive scholarship and research for the increase of knowledge and the improvement of techniques in the healing arts of pharmacy.

DEPARTMENTAL PROGRAMS OF STUDY

During the professional portion of his education, the student may specialize in one of the three following programs:

1. General Pharmacy
2. Hospital or Institutional Pharmacy
3. Pre-Graduate

The General Pharmacy Program prepares a graduate for the practice of community pharmacy which requires the skills and knowledge of the professional man and the operational activities of the businessman in preparing and servicing the medicaments and other health supplies of the community.

The Hospital or Institutional Pharmacy Program prepares a graduate for the practice of hospital or institutional pharmacy which requires skill in procuring, preparing, distributing and controlling the drug supplies, drug information and adjunct materials to his medical care facility.

The Pre-Graduate Program, reserved for superior students, prepares students for the rewarding and successful pursuit of degrees beyond the bachelor degree so that they may prepare for teaching or research positions with an educational institution or a pharmaceutical manufacturer.

Pharmaceutical manufacturers employ pharmacists as analysts of raw materials and finished products, as supervisors in the manufacturing plants and as medical sales representatives.

Opportunities are also available to pharmacy graduates in various local and federal agencies.

RECOMMENDED HIGH SCHOOL PREPARATION

An academic program in high school is prerequisite to enrollment in the Pharmacy School.

<i>Subjects</i>	<i>Recommended Units</i>	<i>Required Units</i>
English	4	4
College Preparatory Mathematics — including algebra (1), plane geometry (1) and additional units in advanced algebra, solid geometry, trigonometry, or advanced mathematics...	4	2
Physical Sciences (Chemistry and Physics)....	2	1
History and Social Sciences.....	2	1
Biological Sciences	1	0
Foreign Language—German or French.....	2	0
Unspecified academic subjects	1	8

TYPICAL PROGRAM FOR THE FRESHMAN YEAR

FIRST SEMESTER

Chemistry
English
Mathematics
Zoology
Physical Education
Health

* SOCIAL SCIENCE ELECTIVES

G. and P. 1, American Government
Psychology 1, Introduction
to Psychology

SECONDARY SEMESTER

Chemistry
Mathematics
Botany
Social Science Elective*
Physical Education

Sociology 1, Introduction
to Sociology

Anthropology 2, Introduction
to Anthropology

S U M M E R S C H O O L

New freshmen students who have met the regular University admission requirements for fall enrollment may begin their studies during the summer rather than await September. The final date for the admission of such students to Summer School is June 1.

The student who enters on this basis and who continues attending summer sessions can shorten his college career by a semester or by a year, depending upon his curriculum and the progress he makes in it.

Courses which are offered during the summer are the same in content and in instruction as are courses offered during the fall and spring semesters. Many students have found the transition from secondary school to college facilitated by attending the summer session. Undergraduate students attending the eight-week session are permitted to register for a maximum of nine semester hour credits, although many prefer to take two courses rather than three during the initial summer.

Appendix A

FEES

GENERAL

All checks or money orders should be made payable to the University of Maryland for the exact amount of the charges. In cases where students have been awarded General Assembly Grants or University Grants, the amount of such grants will be deducted from the bill.

All fees are due and payable at the time of registration, and students should come prepared to pay the full amount of the charges. No student will be admitted to classes until such payment has been made.

The University reserves the right to make such changes in fees and other charges as may be found necessary, although every effort will be made to keep the cost to the student as low as possible.

No degree will be conferred, nor any diploma, certificate, or transcript of record issued to a student who has not made satisfactory settlement of his account.

FEES FOR RESIDENTS AND NON-RESIDENTS

FEES FOR UNDERGRADUATE STUDENTS:

MARYLAND RESIDENTS

	<i>First Semester</i>	<i>Second Semester</i>	<i>Total</i>
Fixed Charges	\$195.00	\$195.00	\$390.00
Instructional Materials	13.00	13.00	26.00
Athletic Fee	20.00	....	20.00
Student Activities Fee	15.00	....	15.00
Special Fee	15.00	....	15.00
Recreational Facilities Fee	40.00	....	40.00
	<hr/> \$298.00	<hr/> \$208.00	<hr/> \$506.00

RESIDENTS OF THE DISTRICT OF COLUMBIA, OTHER STATES AND COUNTRIES

Tuition Fee for Non-Resident Students	250.00	250.00	500.00
Total Fee for Non-Resident Students	<hr/> \$548.00	<hr/> \$458.00	<hr/> \$1,006.00

BOARD AND LODGING

Board (Full Contract)	\$270.00	\$270.00	\$540.00
Partial Board (Contract)	\$195.00	\$195.00	\$390.00
Dormitory Room			
Maryland Residents	\$180.00	\$180.00	\$360.00
Other States and Counties	\$230.00	\$230.00	\$460.00

Full-time undergraduate students who register for the second semester but who were not full-time undergraduate students in the first semester are required to pay the following additional fees: Athletic Fee, \$10.00; Student Activities, \$7.50; Special Fee, \$7.50; Recreational Facilities Fee, \$20.00.

The above fees do not apply to the temporary Married Student Housing Units. The rates for these family units are as follows: two-room apartment \$42.50 per month, three-room apartment \$45.50 per month.

DEFINITION OF RESIDENCE AND NON-RESIDENCE

Students who are minors are considered to be resident students if at the time of their registration their parents have been domiciled in the State of Maryland for at least six months.

The status of the residence of a student is determined at the time of his first registration in the University and may not thereafter be changed by him unless, in the case of a minor, his parents move to and become legal residents of Maryland by maintaining such residence for at least six months. However, the right of the minor student to change from a non-resident status to resident status must be established by him prior to the registration period set for any semester.

Adult students are considered to be residents if at the time of their registration they have been domiciled in Maryland for at least six months provided such residence has not been acquired while attending any school or college in Maryland or elsewhere. *Time spent on active duty in the armed services while stationed in Maryland will not be considered as satisfying the six months period referred to above except in those cases in which the adult was domiciled in Maryland for at least six months prior to his entrance into the armed service and was not enrolled in any school during that period.*

The word "domicile" as used in this regulation shall mean the permanent place of abode. For the purpose of this rule only one domicile may be maintained.

EXPLANATION OF FEES

The application fee for the undergraduate colleges and the summer session partially defrays the cost of processing applications for admission to these divisions of the University. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. Applicants who have enrolled with the University of Maryland in its Evening Division at College Park or Baltimore, or at one of its off-campus centers are not required to pay the fee since they have already paid a matriculation fee.

The Fixed Charges Fee is not a charge for tuition. It is a charge to help defray the cost of operating the University's physical plant, to pay administrative and clerical expenses and other costs which ordinarily would not be included as a cost of teaching personnel and teaching supplies.

The Instructional Materials Fee represents a charge for instructional materials and/or laboratory supplies furnished to students. Full-time undergraduate students subject to the fees set forth below will be billed the appropriate fee and also will be billed the Instructional Materials Fee: Math. 1, \$45; Applied Music, \$40; and P. E. 8 Riding Class, \$26.

The Athletic Fee is charged for the support of the Department of Intercollegiate Athletics. All students are eligible and all students are encouraged to participate in all of the activities of this department and to attend all contests in which they do not participate.

The Student Activities Fee is a mandatory fee included at the request of the Student Government Association. It covers class dues and is used in sponsoring various student activities, student publications and cultural programs.

The Special Fee is used to pay interest on and amortize the cost of construction of the Student Union Building, the Activities Building, and the Swimming Pool.

The Recreational Facilities Fee is paid into a fund which will be used to expand the recreational facilities on the College Park campus, especially the Student Union Building.

The Auxiliary Facilities Fee is paid into a fund which is used for expansion and operation of various facilities such as roads, walks, campus lighting and recreational facilities. These facilities are not funded or are funded only in part by State appropriations.

Full-time undergraduate students who register for the second semester but who were not full-time undergraduate students in the first semester are required to pay the following additional fees: Athletic Fee, \$10.00; Student Activities, \$7.50; Special Fee, \$7.50; Recreational Facilities Fee, \$20.00.

OTHER FEES

UNDERGRADUATE APPLICATIONS

The deadline for the receipt of applications for the Spring Semester is the first workday after January 1.

All applications for full-time undergraduate admission for the Fall Semester at the College Park campus must be received by the University on or before June 1. Any student registering for nine (9) or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. This means that the applicant's education records (except current summer school grades) SAT scores (in the case of new freshmen) and medical examination report must be received by July 15.

Application Fee (see "Explanation of Fees," page 51)	\$ 10.00
Enrollment Deposit Fee	50.00
(This fee is non-refundable after June 1st. At time of registration fee will be applied against University charges)	
Registration Fee—Pre-College Orientation Program	13.00

Late Application Fee	25.00
Matriculation Fee	10.00
Graduation Fee for Bachelor's degree *	10.00
Room Deposit Fee payable upon application for dormitory room	50.00
(To be deducted from the first semester room charges at registration.)	
Vehicle Registration Fee, each vehicle	10.00
(Payable each academic year by all students registered for courses on the College Park campus and who drive on the campus.)	
Special Fee for students requiring additional preparation in Mathematics, per semester	45.00
(Required of students whose curriculum calls for Math. 10 or 18 and who fail in qualifying examination for these courses. Students enrolled in this course and concurrently enrolled for 6 or more credit hours will be considered as full-time students for purposes of assessing fees.)	
Special Guidance Fee per semester (for students who are required or who wish to take advantage of the effective study course, and/or the tutoring service offered by the Office of Intermediate Registration)	15.00
Applied Music Fee (each course)	\$ 40.00
Riding Class Fee	26.00
Fees for Auditors and courses taken for audit are the same as those charged for courses taken for credit at both the undergraduate and graduate levels. Audited credit hours will be added to hours taken for credit to determine whether or not an undergraduate student is full-time or part-time for fee assessment purposes.	
Special students are assessed fees in accordance with the schedule for the comparable undergraduate or graduate classification.	

MISCELLANEOUS FEES AND CHARGES

Part-time Undergraduate Students:	
Fee per credit hour	\$ 20.00
Auxiliary Facilities Fee — Payable each semester or summer session	4.00
Vehicle Reg. Fee, each vehicle	10.00
(The term "part-time students" is interpreted to mean undergraduate students taking 8 semester credit hours or less. Students carrying 9 semester hours are considered to be full time and must pay the regular full-time fees.)	
Late Registration Fee	20.00
(All students are expected to complete their registration, including the filing of class cards and payment of bills, on the regular registration days. Those who do not complete their registration during the prescribed days must pay this fee.)	
Fee for change in registration	\$ 5.00
Fee for failure to report for medical examination appointment	2.00
Special Examination Fee—to establish college credit—per semester hour	5.00
Transcript of Record Fee (one transcript furnished without charge)	1.00
Property Damage Charge: Students will be charged for damage to property or equipment. Where responsibility for the damage can be fixed, the individual student will be billed for it; where responsibility cannot be fixed, the cost of repairing the damage or replacing equipment will be prorated.	
Service Charges for Dishonored Checks: Payable for each check which is returned unpaid by the drawee bank on initial presentation because of insufficient funds, payment stopped, post-dating, drawn against uncollected items, etc.	
For checks up to \$ 50.00	\$ 5.00
For checks from \$ 50.01 to \$100.00	10.00
For checks over \$100.00	20.00

Library Charges:

Fine for failure to return book from General Library before expiration of loan period	per day \$.50
Fine for failure to return book from Reserve Shelf before expiration of loan period	
First hour overdue	1.00
Each additional hour overdue	2.00 max.
In case of loss or mutilation of a book, satisfactory restitution must be made.	
In the event it becomes necessary to transfer uncollected charges to the Cashier's office, an additional charge of \$1.00 is made.	

* An additional late application fee of \$10.00 will be assessed against students who fail to apply for graduation within the first eight weeks of a regular semester or the first three weeks of a summer session. Students who apply after the end of the twelfth week of a regular academic semester and those who apply after the end of the fourth week of a summer session will be required to wait for the next academic semester in order to obtain a diploma.

TEXTBOOKS AND SUPPLIES

Textbooks and classroom supplies: These costs vary with the course pursued, but will average per semester. 50.00

FEES FOR GRADUATE STUDENTS

Fee per semester hour, Resident	\$34.00
Fee per semester hour, Non-resident	40.00
Fee per semester hour, Maryland Teachers	30.00

A Maryland teacher is defined for fee assessment purposes as any full-time professional employee of a school or college located in the State of Maryland and accredited by the State Department of Education. The teacher must be currently under contract or on official leave for the purpose of taking full-time graduate work at the University of Maryland. Teachers enrolling in the Summer Session will be considered as being currently under contract provided that they have a valid contract for the academic year immediately following the Summer Session. Contract status must be established anew at each registration by the submission of a letter, or other appropriate document, provided by the Board of Education of the city or county or principal officer of the school or college in which the teacher is employed. If the letter or document is needed by the teacher for other purposes, he must supply a photocopy which will be retained by the registration clerk. The necessary letter, document or photocopy must be provided at the time of registration.

Application Fee, payable at time of first application for admission to the Graduate School	10.00
Graduation Fee Master's Degree †	10.00
Graduation Fee for Doctor's Degree †	50.00
Auxiliary Facilities Fee (per semester)	4.00
Vehicle Registration Fee, each vehicle	10.00
Foreign Language examination	10.00
Testing Fee (Education Majors)	5.00
Special Fee (full-time graduate students on Baltimore City Campus only)	25.00
Service Charges for Dishonored Checks	\$ 5.00 to \$ 20.00

(See explanation above)

All fees, except Graduation Fee, are payable at the time of registration for each semester.

Graduation Fee must be paid prior to graduation. †

There is no provision for housing graduate students in University dormitories.

FEES FOR UNIVERSITY COLLEGE COURSES

Undergraduate Matriculation Fee (Payable once, at the time of first registration by all undergraduate students, full-time and part-time)	\$ 10.00
Tuition charge for undergraduate students per credit hour	20.00
Tuition charge for GRADUATE students per credit hour:	
Residents of Maryland	34.00
Fee per semester hour, Maryland Teachers	30.00
Non-residents of Maryland (Status as determined upon admission)	40.00
Graduate Education Testing Fee	5.00
Vehicle Registration Fee, College Park Campus, each vehicle	10.00
Auxiliary Facilities Fee	4.00
(Payable at each registration by all students taking courses on the College Park Campus and graduate students taking courses at the Baltimore Center. In the event of a duplicate registration during the same session, the duplicate payment will be refunded provided that the student makes written request to the Registrar.)	
Service Charges for Dishonored Checks	\$5.00 to \$20.00

† An additional late application fee of \$10.00 will be assessed against students who fail to apply for graduation within the first eight weeks of a regular semester or the first three weeks of a summer session. Students who apply after the end of the twelfth week of a regular academic semester and those who apply after the end of the fourth week of a summer session will be required to wait for the next academic semester in order to obtain a diploma.

Baltimore Student Union Fee (Payable each semester by students registering for classes on Baltimore City campus):

Students registering for from one through eleven credits	\$ 3.00
Students registering for twelve credits or more	20.00
Late Registration Fee: Students who do not complete their registration during the scheduled days will be charged a fee of	20.00
Change in Registration Fee (Payable when a student, enrolled in University College courses, or wishes to substitute one course for another or one section of a course for another, or add a course), after he completes registration	5.00

Payment of Fees: Registration is not complete until all fees are paid in full. All checks, money orders, or postal notes should be made payable to the University of Maryland.

WITHDRAWAL AND REFUND OF FEES

Any student compelled to leave the University at any time during the academic year should file an application for withdrawal, bearing the proper signature, in the Office of the Registrar. If this is not done, the student will not be entitled, as a matter of course, to a certificate of honorable dismissal, and will forfeit his right to any refund to which he would otherwise be entitled. The date used in computing refunds is the date the application for withdrawal is filed in the office of the Registrar.

In the case of a minor, withdrawal will be permitted only with the written consent of the student's parent or guardian.

Students withdrawing from the University will be credited for all academic fees charged to them in accordance with the following schedule:

<i>Period from Date Instruction Begins</i>	<i>Refundable</i>
Two weeks or less	80%
Between two and three weeks	60%
Between three and four weeks	40%
Between four and five weeks	20%
Over five weeks	0

The Application Fee, Matriculation Fee and Vehicle Registration Fee are not returnable in any instance.

No part of the charges for room and board is refundable except where the student officially withdraws from the University or where he is given permission by the appropriate officials of the University to move from the residence halls and/or to discontinue dining hall privileges. In these cases, the room refund will be computed by deducting ten percent of the charge for the semester as a service charge and the remainder will be pro rated on a weekly basis. Refunds to students having full board contracts will be calculated in the same manner. No room and/or board refunds will be made after the fourteenth week of the semester. ID Cards with dining hall validation issued to boarding students must be surrendered at the Auditor's Office in the Administration Building on the day of withdrawal before any refund will be processed.

In computing refunds to students who have received the benefit of scholarships and loans from University Funds, the computation will be made in such a way as to return the maximum amount to the scholarship and loan accounts without loss to the University.

No refund of the Athletic, Student Activity, Special Recreational Facilities, and Advisory and Testing Fees is made to students who withdraw at the close of the first semester.

A student who registers as a full-time undergraduate will receive no refunds of Fixed Charges, Instructional Materials Fee, Athletic Fee, etc., when courses are dropped (irrespective of the number of credit hours dropped) unless the student withdraws from the University.

A student who registers as a graduate student or as a part-time undergraduate student will be given an 80% refund of credit hour fees for courses dropped during the first week of classes. No refunds will be made for courses dropped thereafter.

A special refund schedule applies to full-time students who are drafted into the Armed Services or called up as Reservists.

University College students enrolled in off-campus and 8-week courses are subject to a somewhat different refund schedule. Please see the University College Bulletin for details.

TRANSCRIPTS OF RECORDS

Students and alumni may secure transcripts of their scholastic records from the Office of the Registrar. No charge is made for the first copy; for additional copies, there is a charge of \$1.00 for each transcript. Checks should be made payable to the University of Maryland. Transcripts of records should be requested at least two weeks in advance of the date when the records are actually needed. No transcript of a student's record will be furnished any student or alumnus whose financial obligations to the University have not been satisfied.

Appendix B

HONORS, AWARDS

SCHOLARSHIP HONORS—Final honors for excellence in scholarship are awarded to one-fifth of the graduating class in each College. "HIGH HONORS" are awarded to the upper half of this group; "HONORS" to the lower half. To be eligible for honors, a student must complete at least two years of resident work (60 semester hours) at the University with an average of B (3.0) or higher.

MILTON ABRAMOWITZ MEMORIAL PRIZE IN MATHEMATICS—A prize is awarded annually to a junior or senior student majoring in mathematics who has demonstrated superior competence and promise for future development in the field of mathematics and its applications.

THE ALCOA FOUNDATION TRAFFIC AND TRANSPORTATION AWARD to an outstanding senior student majoring in transportation.

ALPHA CHI SIGMA AWARD—The Alpha Rho Chapter of the Alpha Chi Sigma Honorary Fraternity offers annually a year's membership in the American Chemical Society to the senior majoring in Chemistry or Chemical Engineering whose average has been above 3.0 for three and one-half years.

ALPHA LAMBDA DELTA AWARD—Presented to the senior member of the group who has maintained the highest average for three and a half years. She must have been in attendance in the institution for the entire time.

ALPHA LAMBDA DELTA SENIOR CERTIFICATE AWARD—Senior members of Alpha Lambda Delta, honorary scholastic society for women, who have maintained an average of 3.5, receive this certificate.

ALPHA ZETA MEDAL—The Professional Agricultural Fraternity of Alpha Zeta awards annually a medal to the agricultural student in the freshman class who attains the highest average in academic work.

AMERICAN ASSOCIATION OF UNIVERSITY WOMEN ANNUAL GRADUATE PRIZE.

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS AWARD—Free memberships in the Institute for one year and cash prizes for the best paper presented at a Student Branch meeting and for the graduating aeronautical senior with the highest academic standing.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS AWARD—A certificate, pin, and magazine subscription are awarded to the junior member of the Student Chapter who attained the highest overall scholastic average during his freshman and sophomore years.

AMERICAN INSTITUTE OF CHEMISTS AWARD—Presented for outstanding scholarship in chemistry and for high character.

AMERICAN SOCIETY OF CIVIL ENGINEERS AWARD—The Maryland Section of the American Society of Civil Engineers awards annually the first year's dues of an associate membership in the Society to a senior member of the Student Chapter on recommendation of the faculty of the Department of Civil Engineering.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AWARD—Presented to the Senior member who contributed most to the local chapter.

AMERICAN SOCIETY FOR TESTING MATERIALS—A student membership prize is awarded to an engineering senior in recognition of superior scholastic ability and demonstrated interest in engineering materials and their evaluation.

APPLEMAN-NORTON AWARD IN BOTANY—The Department of Botany offers a scholarship award of \$100 in honor of Emeritus Professors C. O. Appleman and J. B. S. Norton to a senior major in Botany who is considered worthy on the basis of demonstrated ability and excellence in scholarship. The scholarship is awarded by the Committee on scholarships upon the recommendation of a committee of the faculty of the Department of Botany.

ASSOCIATED WOMEN STUDENTS AWARDS—Presented for outstanding achievement, character, and service to the University.

DAVID ARTHUR BERMAN MEMORIAL AWARD—This award is offered by the family of David Arthur Berman to the highest ranking junior in the Department of Chemical Engineering who is also a member of Tau Beta Pi.

DINAH BERMAN MEMORIAL MEDAL—The Dinah Berman Memorial Medal is awarded annually to the sophomore who has attained the highest scholastic average of his class in the College of Engineering. This medal is given by Mr. Benjamin Berman.

B'NAI B'RITH AWARD—The B'nai B'rith Women of Prince Georges County present a Book Award for excellence in Hebrew Studies.

BUSINESS EDUCATION AWARD OF MERIT to a student in Business Education in recognition of outstanding achievement as a student.

CITIZENSHIP PRIZE FOR MEN—President Emeritus H. C. Byrd of the Class of 1908, annually presents this award to the member of the senior class who, during his collegiate career, has most nearly typified the model citizen and who has done most for the general advancement of the interests of the University.

CITIZENSHIP PRIZE FOR WOMEN—This prize is presented annually as a memorial to Sally Sterling Boyd, by her children, to that member of the senior class who best exemplifies the enduring qualities of the pioneer woman. These qualities typify self dependence, courtesy, aggressiveness, modesty, capacity to achieve objectives, willingness to sacrifice for others, strength of character, and those other qualities that enabled the pioneer woman to play such a fundamental part in the building of the nation.

THE CARROLL E. COX GRADUATE SCHOLARSHIP AWARD in Botany to the outstanding graduate student in the Department of Botany during the last year.

BERNARD L. CROZIER AWARD—The Maryland Association of Engineers awards a cash prize of twenty-five dollars to the senior in the College of Engineering who, in the opinion of the faculty, has made the greatest improvement in scholarship during his stay at the University.

VIRGINIA DARE AWARD—The Virginia Dare Extract Company awards annually a plaque and \$25.00 to the outstanding student in ice cream manufacturing with an overall good standing in dairy.

THE DANFORTH FOUNDATION AND THE RALSTON PURINA AWARDS—The Danforth Foundation and the Ralston Purina Company of St. Louis offer two summer awards to outstanding men students in the College of Agriculture, one for a student who has successfully completed his junior year, the other for a student who has successfully completed his freshman year. The purpose of these awards is to bring together outstanding young men for leadership training.

The Danforth Foundation and the Ralston Purina Company of St. Louis offer two summer awards to outstanding Home Economics women students, one to a junior and one to a freshman. The purpose of these is to bring together outstanding young women for leadership training.

THE DELMARVA TRAFFIC CLUB AWARD to a junior student majoring in transportation whose residence is on the Maryland Eastern Shore.

DELTA DELTA DELTA MEDAL—This sorority awards a medal annually to the woman who attains the highest average in academic work during the sophomore year.

DELTA GAMMA SCHOLARSHIP AWARD—This award is offered to the woman member of the graduating class who has maintained the highest average during three and one-half years at the University.

DELTA SIGMA PI SCHOLARSHIP KEY—This award is offered to a member of the graduating class who has maintained the highest scholastic average for the entire four-year course in the College of Business and Public Administration.

NATHAN L. DRAKE AWARD—Presented by the Alpha Rho Chapter of Alpha Chi Sigma to the most promising student who is majoring in chemistry and has completed the sophomore year.

EDUCATION ALUMNI AWARD—Presented to the outstanding senior man and senior woman in the College of Education.

ENGLISH DEPARTMENT SHORT FICTION AWARD—The English Department awards an annual prize of one hundred dollars provided by an anonymous donor, to the undergraduate or graduate student who has written and submitted for the judgment of a faculty committee the best piece of short fiction during the current school year.

GENERAL ELECTRIC COMPANY prize to the outstanding first year graduate student in physics and to the outstanding first year graduate student in astronomy.

GODDARD MEDAL—The James Douglass Goddard Memorial Medal is awarded annually to the resident of Prince Georges County, born therein, who makes the highest average in his studies and who at the same time embodies the most manly attributes. The medal is given by Mrs. Anne G. Goddard James of Washington, D.C.

CHARLES B. HALE DRAMATIC AWARDS—The University Theatre recognizes annually the man and woman members of the senior class who have done most for the advancement of dramatics at the University.

HAMILTON AWARD—This award is offered by the Hamilton Watch Company to the graduating senior in the College of Engineering who has most successfully combined proficiency in his major field of study with achievements—either academic, extra-curricular, or both—in the social sciences or humanities.

THE HASKINS AND SELLS FOUNDATIONS, INC., AWARD to the senior student in the College of Business and Public Administration concentrating in accounting who has demonstrated excellent ability in this field of study.

HOME ECONOMICS ALUMNI AWARD—Presented to the student outstanding in application of home economics in her present living and who shows promise of carrying these into her future home and community.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERING AWARD—The Washington Section of the Institute of Electrical and Electronics Engineers defrays the expenses of a year's membership as an associate in the Institute for the senior doing the most to promote Student Branch activities.

JOE ELBERT JAMES MEMORIAL AWARD—Gold watch annually awarded to the graduating senior in horticulture on basis of scholarship and promise of future achievement.

LEIDY CHEMICAL COMPANY AWARD to an outstanding student majoring in chemistry.

MARYLAND-DELAWARE PRESS ASSOCIATION ANNUAL CITATION—Presented to the outstanding senior in journalism.

MARYLAND RECREATION AND PARKS SOCIETY AWARD to an outstanding senior majoring in recreation.

MEN'S LEAGUE AWARD to the male senior who gave the most to sports.

MEN'S LEAGUE CERTIFICATES—Offered for outstanding achievement, character, and service to the University.

MEN'S LEAGUE CUP—This award is offered by the Men's League to the graduating male senior who has done the most for the male student body.

MOTOR FLEET SUPERVISORS AWARD to a student majoring in transportation in the College of Business and Public Administration.

NATIONAL SOCIETY OF FIRE PROTECTION ENGINEERS AWARDS—Presented to the most outstanding senior and sophomore in the Fire Protection curriculum.

NOXZEMA CHEMICAL COMPANY SCHOLARSHIP AWARD to an undergraduate student in chemistry.

OMICRON NU SORORITY MEDAL—This honorary sorority awards a medal annually to the freshman woman in the College of Home Economics who attains the highest scholastic average during the first semester.

PHI BETA KAPPA JUNIOR AWARD—An award to be presented to the junior initiate into Phi Beta Kappa who has attained the highest academic average.

PHI BETA KAPPA—LEON P. SMITH AWARD—The award of the Gamma of Maryland Chapter of Phi Beta Kappa is presented to the graduating senior with the highest cumulative scholastic average whose basic course program has been in the liberal studies.

PHI CHI THETA KEY—The Phi Chi Theta Key is awarded to the outstanding graduating senior woman in the College of Business and Public Administration on the basis of scholarship, activities, and leadership.

PHI DELTA KAPPA AWARD—Presented to an outstanding man in the graduating class of the College of Education.

PHI SIGMA AWARDS for outstanding achievement in the biological sciences to an undergraduate student and a graduate student.

PI DELTA EPSILON NATIONAL MEDAL OF MERIT AWARDS—Offered by the National Council of Pi Delta Epsilon to the outstanding senior woman and the outstanding senior man in Journalism activities.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of broadcasting.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of Business.

PI DELTA EPSILON AWARD to the outstanding freshman in the field of communications.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of editorial journalism.

PI TAU SIGMA AWARD—An annual handbook award to the most outstanding sophomore in mechanical engineering on the basis of scholastic average and instructors' ratings.

PILOT FREIGHT CARRIERS, INC., AWARD to the senior student in the College of Business and Public Administration who has majored in Transportation and who has demonstrated competence in this field of study.

PUBLIC RELATIONS SOCIETY OF AMERICA—The Baltimore Chapter of PRSA presents an annual citation to the outstanding senior majoring in public relations.

SIGMA ALPHA OMICRON AWARD—This award is presented to a senior student majoring in Microbiology for high scholarship, character and leadership.

THE SIGMA CHAPTER, PHI DELTA GAMMA AWARD to an outstanding woman who has completed the requirements for the doctoral degree.

DR. LEO AND RITA SKLAR GENERAL HONORS AWARDS—Dr. Leo Sklar, A&S '37, and his wife, Rita Sklar, annually fund four awards for excellence in the General Honors Program of the College of Arts and Sciences. These awards are given to the Outstanding Student in the General Honors Program (\$400.00), the Outstanding General Honors senior (\$300.00), the Outstanding General Honors junior (\$300.00), and the Outstanding General Honors sophomore (\$300.00).

ALGERNON SYDNEY SULLIVAN AWARD—The New York Southern Society, in memory of its first president, awards annually medallions and certificates to one man and one woman of the graduating class and one non-student who evince in their daily life a spirit of love for and helpfulness to other men and women.

TAU BETA PI AWARD—The Maryland Beta Chapter of Tau Beta Pi Association, national engineering honor society, awards an engineer's handbook to the junior in the College of Engineering who during his sophomore year has made the greatest improvement in scholarship over that of his freshman year.

WALL STREET JOURNAL STUDENT ACHIEVEMENT AWARD—Awarded annually to the graduating senior who has maintained the highest scholastic achievement in the field of financial administration. The award consists of a silver medal embedded in clear plastic and one year's subscription to the *Wall Street Journal*.

THE ARTHUR YOUNG AND CO. FOUNDATION, INC., AWARDS to exceptional senior students concentrating in accounting who are registered in the College of Business and Public Administration.

AIR FORCE ROTC AWARDS

AFROTC ANGEL FLIGHT AWARD to the outstanding member of the AFROTC Angel Flight.

AIR FORCE TIMES AWARD to the senior cadet at each detachment who has distinguished himself by contributing materially to constructive public attention for the corps of cadets.

ALUMNI CUP to the outstanding flight in the corps of cadets.

AMERICAN LEGION AWARDS to outstanding senior and junior cadets who have demonstrated military excellence and scholastic achievement.

ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION AWARD to the outstanding senior cadet majoring in electrical, electronics or communications engineering.

ARNOLD AIR SOCIETY AWARD to the advanced cadet selected by the Arnold Air Society as the cadet who has contributed the most to the advancement of AFROTC through activities of the Arnold Air Society.

COBLENTZ MEMORIAL CUP to the outstanding group in the corps of cadets.

DISABLED AMERICAN VETERANS GOLD CUP to the senior cadet who has displayed outstanding leadership, scholarship, and citizenship.

DISTINGUISHED AFROTC CADET AWARDS to those seniors who possess outstanding qualities of leadership and high moral character and who meet the prescribed standings in their academic and military studies.

GENERAL DYNAMICS AWARD to the sophomore cadet displaying outstanding leadership and scholarship qualities and who has been selected for the Professional Officer Course.

GOVERNOR'S CUP to the outstanding squadron in the corps of cadets.

NATIONAL DEFENSE TRANSPORTATION ASSOCIATION AWARD to the outstanding senior cadet majoring in transportation.

RESERVE OFFICERS ASSOCIATION AWARDS to the outstanding junior and senior in the corps of cadets.

SOCIETY OF AMERICAN MILITARY ENGINEERS AWARDS to a junior and a senior cadet displaying outstanding scholastic achievement and leadership and majoring in the field of engineering.

SONS OF THE AMERICAN REVOLUTION MEDALS to a two-year and a four-year cadet displaying outstanding aptitude for the military.

ATHLETIC AWARDS

ATLANTIC COAST CONFERENCE AWARD—A plaque is awarded each year to a senior in each conference school for excellence in scholarship and athletics.

THE ALVIN L. AUBINOE BASKETBALL TROPHY—This trophy is offered by Alvin L. Aubinoe for the senior who has contributed most to the squad.

THE ALVIN L. AUBINOE FOOTBALL TROPHY—This trophy is offered by Alvin L. Aubinoe for the unsung hero of the current season.

THE ALVIN L. AUBINOE TRACK TROPHY—This trophy is offered by Alvin L. Aubinoe for the senior who has contributed most to the squad during the time he was on the squad.

JOHN T. BELL SWIMMING AWARD—To the year's outstanding swimmer or diver.

LOUIS W. BERGER TROPHY—Presented to the outstanding senior baseball player.

WILLIAM P. COLE, III, MEMORIAL LACROSSE AWARD—This award, offered by the teammates of William P. Cole, III, and the coaches of the 1940 National Champion team, is presented to the outstanding midfielder.

THE GEORGE C. COOK MEMORIAL SCHOLARSHIP TROPHY—Awarded annually to a member of the football team with the highest scholastic average.

JOE DECKMAN-SAM SILBER TROPHY—This trophy is offered by Joseph H. Deckman and Samuel L. Silber to the most improved defense lacrosse player.

GEARY F. EPPLEY AWARD—Offered by Benny and Hotsy Alperstein to the graduating male senior athlete who, during his three years of varsity competition, lettered at least once and attained the highest over-all scholastic average.

HALBERT K. EVANS MEMORIAL TRACK AWARD—This award, given in memory of "Hermie" Evans, of the Class of 1940, by his friends, is presented to graduating senior trackmen.

HERBERT H. GOODMAN MEMORIAL TROPHY—This trophy is awarded to the most outstanding wrestler of the year.

CHARLES LEROY MACKERT TROPHY—This trophy is offered by William K. Krouse to the Maryland student who has contributed most to wrestling while at the University.

MARYLAND RING—The Maryland Ring is offered as a memorial to Charles L. Linhardt, of the Class of 1912, to the Maryland man who is adjudged the best athlete of the year.

CHARLES P. MC CORMICK TROPHY—This trophy is offered by Charles P. McCormick to the senior letterman who has contributed most to swimming during his collegiate career.

ANTHONY C. NARDO MEMORIAL TROPHY—This trophy is awarded to the best football lineman of the year.

EDWIN POWELL TROPHY—This trophy is offered by the Class of 1913 to the player who has rendered the greatest service to lacrosse during the year.

SILVESTER WATCH FOR EXCELLENCE IN ATHLETICS—A gold watch, given in honor of former president of the University, R. W. Silvester, is offered annually to "the man who typifies the best in college athletics."

TEKE TROPHY—This trophy is offered by the Maryland Chapter of Tau Kappa Epsilon Fraternity to the student who during his four years at the University has rendered the greatest service to football.

ROBERT E. THEOFELD MEMORIAL—This trophy is presented by Dr. and Mrs. Harry S. Hoffman and is awarded to the golfer who most nearly exemplifies the competitive spirit and strong character of Robert E. Theofeld, a former member of the boxing team.

MUSIC AWARDS

ASSISTANT DIRECTOR'S AWARD to the outstanding member of the Symphonic Band.

DIRECTOR'S AWARD to the concert band member who demonstrated the most improvement in musicianship during the year.

KAPPA KAPPA PSI AWARD to the most outstanding band member of the year.

SIGMA ALPHA IOTA ALUMNAE AWARD for outstanding musical performance.

SIGMA ALPHA IOTA DEAN'S HONOR AWARD for service and dedication.

SIGMA ALPHA IOTA HONOR CERTIFICATE to the senior with the highest scholastic average.

SIGMA ALPHA IOTA LEADERSHIP AWARD based on personality, student activities, fraternity service, and scholarship.

TAU BETA SIGMA AWARD to the outstanding band sorority member of the year.

Awards are presented to the members of the University Bands, the University Orchestras, and the Men's and Women's Glee Clubs who serve faithfully throughout the year.

STUDENT GOVERNMENT AWARDS

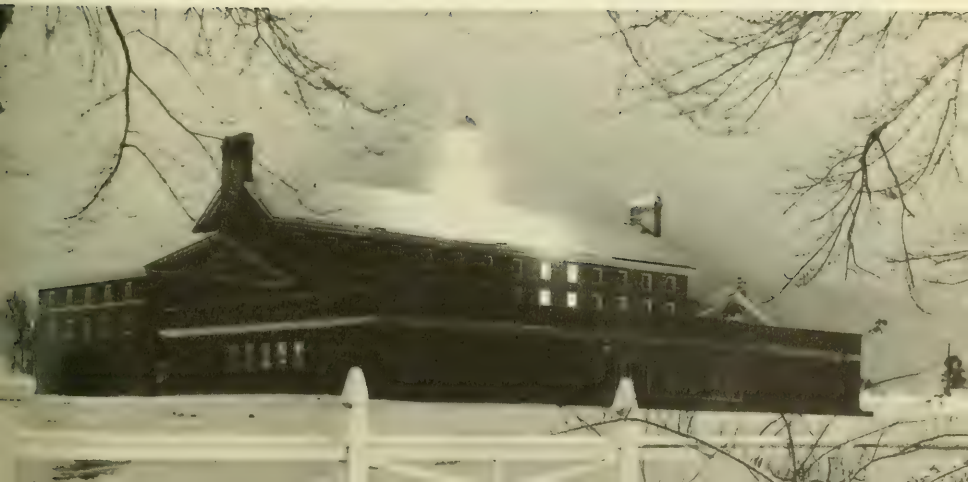
Keys are awarded to the members of the Executive Committee of the Student Government Association, Men's League, Association of Women Students, and other organizations who faithfully perform their duties throughout the year.

IMPORTANT NOTICE

The statements in this booklet are for information only. The provisions of this publication *do not* form a contract between the student and the University of Maryland.

Official notice concerning student life, grading systems and other regulations are to be found in the publication *University General and Academic Regulations*, made available to all incoming students.

The University reserves the right to change any provision or requirement at any time within the student's term of residence. The University further reserves the right, at any time, to ask a student to withdraw when it considers such action to be in the best interests of the University.



Appendix C

SCHOLARSHIPS AND FINANCIAL AIDS

All requests for information concerning scholarships and grants-in-aid should be addressed to the Director of the Office of Student Aid, University of Maryland, College Park, Maryland 20742. Regulations and procedures for the award of scholarships are formulated by the Committee on Financial Aids.

The Board of Regents of the University authorizes the award of a limited number of scholarships each year to deserving students. Applicants are subject to the approval of the Director of Admissions insofar as qualifications for admission to the University are concerned. All recipients are subject to the academic and non-academic regulations and requirements of the University.

Scholarships and grants are awarded to young men and women based upon apparent academic ability and financial need. In making awards, consideration is given to character, achievement, participation in student activities and to other attributes which may indicate success in college. It is the intent of the Committee to make awards to those qualified who might not otherwise be able to provide for themselves an opportunity for higher education.

The recipient of the scholarship or a grant is expected to make at least normal progress toward a degree. Normal progress toward a degree is defined by the Academic Regulations.

The Committee on Financial Aids reserves the right to review the scholarship program annually and to make adjustments in the amounts and recipients of awards in accordance with the funds available and scholastic attainment.

The types of scholarships, grants and loan funds available follow:

FULL SCHOLARSHIPS

The University awards fifty-six full scholarships covering board, lodging, fixed charges, fees and books. Not more than twenty of these scholarships may be held by out-of-state students and at least twelve are reserved for women. Scholastic achievement and participation in student activities are given primary consideration in the award of these scholarships.

UNIVERSITY GRANTS

The University awards to deserving and qualified secondary school graduates a limited number of grants covering fixed charges only.

GENERAL ASSEMBLY GRANTS

Each State Senator is assigned 58 scholarship units worth \$250 each which may be awarded singly or in multiples to students in various Maryland colleges. Each member of the House of Delegates is assigned two grants for fixed charges to the University of Maryland. Eligibility is determined on the basis of financial need and the results of a competitive examination given by the Maryland State Scholarship Board.

SPECIAL ACADEMIC SCHOLARSHIPS

A limited number of scholarships is awarded each year to students of exceptional academic ability out of funds derived from campus enterprises. The amount of these scholarships varies depending upon the extent of need.

TEACHER EDUCATION GRANTS

The General Assembly of Maryland provides grants equivalent to fixed charges to Maryland residents pursuing certain teacher education curricula on a full-time basis. Recipients agree to teach in Maryland public schools for at least two years immediately following graduation. The agreement form must be signed by the student and countersigned by the parent, guardian or other responsible adult.

GENERAL STATE TUITION SCHOLARSHIPS

The General Assembly of Maryland provides a number of tuition scholarships to students entering college for the first time. These scholarships may be used in any approved institution of higher education within the State. At the University of Maryland, they cover the item listed as fixed charges. Awards are made by the State Scholarship Board based upon financial need and the results of a competitive examination.

ENDOWED AND ANNUAL SCHOLARSHIPS AND GRANTS

The University has a number of endowed and annual scholarships and special grants. Brief descriptions of these awards follow:

ALBRIGHT SCHOLARSHIP—The Victor E. Albright Scholarship is open to graduates of Garrett County high schools who were born and reared in that county.

ALCOA FOUNDATION TRAFFIC SCHOLARSHIP—An award of \$500 is given to an outstanding junior student majoring in Transportation in the College of Business and Public Administration.

ALPHA PHI OMEGA (EPSILON MU CHAPTER) SCHOLARSHIP—This scholarship is awarded annually to a freshman student having a background in the Boy Scouts of America.

ALUMNI SCHOLARSHIPS—A limited number of scholarships are made possible through the gifts of alumni and friends to the Alumni Annual Giving Program of the Office of Endowment and Gifts.

ALUMNI ASSOCIATION OF MONTGOMERY COUNTY SCHOLARSHIPS—A limited number of scholarships are available to residents of Montgomery County.

ALUMNI ASSOCIATION OF THE SCHOOL OF PHARMACY SCHOLARSHIPS—The Alumni Association of the School of Pharmacy of the University of Maryland makes available annually scholarships to qualified pre-pharmacy students on the basis of character, achievement and need. These scholarships are open only to residents of the State of Maryland. Each scholarship not exceeding \$500 per academic year is applied to expenses at College Park.

ALUMNI BAND SCHOLARSHIP—A limited number of awards to freshmen are sponsored by the University of Maryland Band Alumni Organization. Recipients are recommended by the Music Department after a competitive audition held in the spring.

ETHEL R. ARTHUR MEMORIAL SCHOLARSHIP—This memorial scholarship fund has been established by Irving J. Cohen, M.D. At least one \$250 award is made each year by the Scholarship Committee. A preference is given to students from Baltimore.

ALVIN L. AUBINOE STUDENT AID PROGRAM—Scholarship grants up to \$500 per school year to students in engineering, preferably those studying for careers in civil engineering, architecture or light construction.

BALTIMORE PANHELLENIC ASSOCIATION SCHOLARSHIP—A scholarship is awarded annually by the Baltimore Panhellenic Association to a student entering the junior or senior class, who is an active member of a sorority, who is outstanding in leadership and scholarship and who needs financial assistance.

BALTIMORE SUNPAPERS SCHOLARSHIP IN JOURNALISM—The Board of Trustees of the A. S. Abell Foundation, Inc., contributes funds to provide one or more \$500 scholarships to students majoring in editorial journalism.

BAYSHORE FOODS, INC. SCHOLARSHIP—A grant of \$500 is made available annually by J. McKenny Willis and Son., Inc., Grain, Feed and Seed Company of Easton, Maryland, to an outstanding student in vocational agriculture in Talbot County who will matriculate in the College of Agriculture.

BLACK AND DECKER MANUFACTURING COMPANY SCHOLARSHIP—A scholarship of \$500 per year is provided for a Maryland resident who promises to teach Industrial Arts or Vocational-Industrial Education in Maryland for two years after graduation.

BORDEN AGRICULTURAL SCHOLARSHIP—A Borden Agricultural Scholarship of \$300 is granted to that student in the College of Agriculture who has had two or more of the regularly listed courses in dairying and who, upon entering the senior year of study, has achieved the highest average grade of all other similarly eligible students in all preceding college work.

CAMPUS CHEST SCHOLARSHIP—A full tuition scholarship is made available by the Campus Chest Council of the University.

Educational Foundation in memory of the late George C. Cook. Preference shall be given to students interested in a career in business administration or marketing.

GEORGE C. COOK SCHOLARSHIP—A full scholarship is made available by the Maryland

DR. ERNEST N. CORY SCHOLARSHIP—This memorial award is made annually to an outstanding junior or senior recommended by the College of Agriculture, preferably one majoring in Entomology.

DAIRY TECHNOLOGY SCHOLARSHIP AND GRANTS—The Dairy Technology Society of Maryland and the District of Columbia provides a limited number of scholarships and grants-in-aid for students majoring in Dairy Products Technology.

DOUGLAS AIRCRAFT COMPANY SCHOLARSHIP—An \$800 scholarship to be awarded to an outstanding and deserving senior student in aeronautical, electrical, or mechanical engineering in this order of preference. Preference is given to students who indicate a willingness to accept employment in California.

EXEL SCHOLARSHIP—A substantial grant for endowed scholarships was made by Deborah B. Exel.

FMC CORPORATION SCHOLARSHIP—An annual award of \$500 is made available for a senior in Chemical Engineering.

ANNE ARUNDEL COUNTY VOLUNTEER FIREMEN'S ASSOCIATION GRANT—This \$300 is awarded to a high school graduate who will enroll in the Fire Protection Curriculum in the College of Engineering. The award is normally for four years.

BALTIMORE COUNTY VOLUNTEER FIREMAN'S ASSOCIATION GRANT—This \$350 annual grant is awarded to a student who will enroll in the Fire Protection Curriculum in the College of Engineering. The award is normally for four years.

DISTRICT OF COLUMBIA FIRE FIGHTERS ASSOCIATION GRANT—A \$150 grant is awarded to a student who has completed his freshman year or has advanced standing in the Fire Protection Curriculum.

DISTRICT OF COLUMBIA FIRE FIGHTERS ASSOCIATION, I.A.F.F. GRANT—A \$150 grant is awarded to a student who has completed his freshman year in the Fire Protection Curriculum.

LADIES AUXILIARY TO THE MARYLAND STATE FIREMEN'S ASSOCIATION GRANT—This \$500 grant is awarded to an outstanding high school graduate who will enroll in the Fire Protection Curriculum in the College of Engineering. The award is normally available for four years.

MARYLAND STATE FIREMEN'S ASSOCIATION GRANT—A \$300 scholarship is awarded annually to an outstanding high school student who enrolls in the Fire Protection Curriculum of the College of Engineering. This scholarship is for four years.

PRINCE GEORGES COUNTY VOLUNTEER FIREMEN'S ASSOCIATION GRANT—An annual scholarship of \$300 is awarded to an outstanding high school student who enrolls in the Fire Protection Curriculum of the College of Engineering.

FOOD FAIR STORES FOUNDATION SCHOLARSHIPS—Several scholarships are available for \$250 per academic year.

VICTOR FRENKIL SCHOLARSHIP—A scholarship of \$250 is granted annually by Mr. Victor Frenkil of Baltimore to a student from Baltimore City in the freshman class of the University.

FUTURE NURSES CLUBS SCHOLARSHIP—A limited number of \$300 scholarships are made available by the Future Nurses Clubs of Maryland which are sponsored by the Women's Auxiliary of the Medical and Chirurgical Faculty of Maryland and the Maryland League of Nursing. These scholarships are available to freshmen students from Maryland preparing for nursing.

GAMMA PHI BETA ALUMNI SCHOLARSHIP—Two annual scholarships are available to teachers employed in the teaching field. The awards pay tuition costs of graduate course designed for training teachers of gifted children.

GENERAL MOTORS SCHOLARSHIP—This scholarship is granted annually to an outstanding individual entering the freshman year.

GODDARD MEMORIAL SCHOLARSHIP—Four \$500 scholarships are available annually under the terms of the James and Sarah E. R. Goddard Memorial Fund established through the wills of Morgan E. Goddard and Mary Y. Goddard.

ROSE L. GRANT SCHOLARSHIP—At least \$500 each year is made available to be awarded by the Scholarship Committee.

JOHN WILLIAM GUCKEYSON MEMORIAL SCHOLARSHIP—A scholarship of \$100 is granted annually by Mrs. Hudson Dunlap as a memorial to John William Guckeyson, an honored Maryland alumnus.

JAMES HARTIN ENGINEERING SCHOLARSHIP AND DONALD PETER SHAW MEMORIAL SCHOLARSHIP—These two scholarships of \$300 each are made available annually by Mr. & Mrs. David C. Hartin. The first is awarded to a male student in the College of Engineering and the second to a male student in any college other than Education, or to a female student in Nursing. These awards will be made to worthy students who are helping to earn their own college expenses.

HASKINS AND SELLS FOUNDATION, INC. AWARD—A scholarship of \$500 is provided for an exceptional senior student majoring in accounting in the College of Business and Public Administration.

WILLIAM RANDOLPH HEARST FOUNDATION SCHOLARSHIPS—These scholarships are made available through a gift of the Baltimore News American, one of the Hearst newspapers, in honor of William Randolph Hearst. Scholarships up to \$1000 are awarded annually to undergraduates pursuing a program of study in journalism. Scholarships up to \$1000 are awarded annually for graduate study in history.

IOTA LAMBDA SIGMA (NU CHAPTER) SCHOLARSHIP—This \$200 scholarship is awarded annually to a male student in the Industrial Education curriculum. The student must be a resident of the State of Maryland and signify his intention of teaching in Maryland.

KAPPA KAPPA GAMMA NURSING SCHOLARSHIP—This \$100 Scholarship is made available annually by the Gamma Psi chapter of the Kappa Kappa Gamma Sorority to a worthy student preparing for a career in nursing.

VENIA M. KELLER GRANT—The Maryland State Council of Homemakers' Clubs makes available this grant of \$100 which is open to a Maryland young man or woman of promise who is recommended by the College of Home Economics.

KIWANIS SCHOLARSHIP—The J. S. Ray Memorial Scholarship covering tuition is awarded by the Prince Georges Kiwanis Club to a male resident of Prince Georges County, Maryland, who, in addition to possessing the necessary qualifications for maintaining a satisfactory scholarship record, must have a reputation of high character and attainment in general all-around citizenship.

KIWANIS CLUB OF LAUREL SCHOLARSHIP—An annual award of \$400 is made available to be awarded by the Scholarship Committee to needy students, preferably from the Laurel area.

SAMUEL J. LEFRAK SCHOLARSHIP—A scholarship in honor of Geary F. Eppley, Dean of Men Emeritus, has been established by an alumnus Mr. Samuel J. Lefrak, President of the Lefrak Organization, Forest Hills, New York. The award of \$1,000 is made to a deserving sophomore who excels in both athletics and scholarship, to be used during his last two years at the University.

LEIDY CHEMICAL FOUNDATION SCHOLARSHIP—A scholarship of \$500 is granted annually to a graduate or undergraduate student preparing for a career in the general field of chemistry.

CHRISTIAN R. AND MARY F. LINDBACK FOUNDATION SCHOLARSHIP—The Trustees of the Christian R. and Mary F. Lindback Foundation provide an annual gift to the University, one-half of which is given for scholarships in agriculture and one-half for awards to the faculty for distinguished teaching.

HELEN ALETTA LINTHICUM SCHOLARSHIP—These scholarships, several in number, were established through the benefaction of the late Mrs. Aletta Linthicum, widow of the late Congressman Charles J. Linthicum, who served in Congress from the Fourth District of Maryland for many years.

LIONS INTERNATIONAL SCHOLARSHIP—An award of \$500 is available to a freshman who competes in the Lions Club (District 22-C) Annual Band Festival. A recipient is recommended by the Music Department after a competitive audition in the spring.

THE M CLUB GRANTS—The M Club of the University of Maryland provides each year a limited number of awards.

DR. FRANK C. MARINO SCHOLARSHIP—Dr. Frank C. Marino provides a \$200 annual scholarship in Nursing Education.

MARYLAND CONSUMER FINANCE SCHOLARSHIP—A scholarship fund of \$500 per year is made available by the Maryland Consumer Finance Association. It may be awarded to one student or divided and awarded to two students. The awards are made to Maryland residents.

MARYLAND MOTOR FLEET SUPERVISORS AWARD—An award of \$200 is given to a junior student with an interest in motor fleet work majoring in transportation in the College of Business and Public Administration.

MARYLAND PHARMACEUTICAL ASSOCIATION SCHOLARSHIP—The Maryland Pharmaceutical Association makes available annually scholarships to pre-pharmacy students on the basis of character, achievement and need. Each scholarship not exceeding \$500 per academic year is used in partial defrayment of fees and expenses at College Park. These scholarships are open only to residents of the State of Maryland.

EUGENE E. AND AGNES F. MEYER SCHOLARSHIPS—A number of scholarships are made available each year to promising students with preferential consideration to children of persons employed in public service.

MORTAR BOARD SCHOLARSHIP—The Mortar Board Scholarship is awarded annually to a women student on the basis of scholastic attainment, and need.

DR. RAY A. MURRAY SCHOLARSHIP—This award, sponsored by Maryland Chapter No. 32 of the National Institute of Farm and Land Brokers, is to be made to a worthy sophomore in the Department of Agricultural Economics, College of Agriculture.

NOPCO SCHOLARSHIP—Two scholarships at \$250 each are provided for students in the College of Agriculture by the Nopco Chemical Company.

PENINSULA HORTICULTURAL SOCIETY SCHOLARSHIP—The Peninsula Horticultural Society provides annually a \$200 scholarship to the most deserving junior or senior student, a resident of Maryland from the Eastern Shore counties, who is majoring in Horticulture or related subjects.

PHI BETA KAPPA SCHOLARSHIP—A scholarship is awarded to the student who at the end of the junior year has attained the highest cumulative average in liberal sources and whose basic course program is in liberal studies.

PHI ETA SIGMA SCHOLARSHIP—A limited number of \$100 scholarships are available to young men entering the sophomore class and who have achieved an academic average of 3.5 or higher during the freshman year.

PILOT FREIGHT CARRIERS, INC., AWARD—A \$500 award is made to a senior student in the College of Business and Public Administration who has majored in transportation.

PURCHASING MANAGEMENT ASSOCIATION OF BALTIMORE, INC., SCHOLARSHIP—An annual award of \$500 is made available to be awarded by the Scholarship Committee to a junior or senior student enrolled in a program preparing for a career in business administration or business management.

READ'S DRUG STORES FOUNDATION SCHOLARSHIPS—The Read's Drug Stores Foundation contributes annually several scholarships to pre-pharmacy students on the basis of achievement, character and need. Each scholarship not exceeding \$500 per academic year is applied to the fees and expenses at College Park. Recipients must be residents of the State of Maryland.

MARY ELIZABETH ROBY MEMORIAL SCHOLARSHIP—An endowed scholarship has been established by the University Park Republican Women's Club. Limited awards are made to women entering the junior or senior years who are studying in the field of political science. A preference is given to residents of Prince Georges County.

DR. FERN DUEY SCHNEIDER GRANT—A \$100 grant is available to a foreign woman student enrolled in the College of Education, and who has completed at least one semester in residence at the University. Funds for the grant are contributed by the Montgomery and Prince Georges County Chapters of the Delta Kappa Gamma Society.

A limited number of grants from the SEARS ROEBUCK FOUNDATION are available for students in the College of Home Economics.

JOSEPH M. VIAL MEMORIAL SCHOLARSHIP IN AGRICULTURE—A \$600 per year scholarship is made available by Mr. and Mrs. A. H. Seidenspinner to be awarded upon the recommendation of the College of Agriculture.

SOUTHERN STATES COOPERATIVE SCHOLARSHIPS—Two scholarships are awarded each year to sons of Southern States members—one for outstanding work in 4-H Club and the other for outstanding work in FFA. The amount of each scholarship is \$300 per year and will continue for four years.

ADELE H. STAMP SCHOLARSHIP—This scholarship of \$250 is awarded annually to a sophomore who is an active sorority member or pledge, who is outstanding in leadership and scholarship and who needs financial assistance. Funds for this scholarship are provided by the University of Maryland Panhellenic Association.

JANE G. S. TALIAFERRO SCHOLARSHIP—Under the terms of the will of the late Janie G. S. Taliaferro a bequest has been made to the University of Maryland to provide scholarship aid to worthy students.

UNIVERSITY WOMEN'S CLUB, INC. MEMORIAL SCHOLARSHIP FUND—A scholarship of \$150 is awarded each year to a junior or senior woman student on the basis of academic record, financial need, and qualities of leadership and character. The funds are contributed by the Memorial Fund Committee of the University Women's Club of Washington, D.C.

WESTERN ELECTRIC SCHOLARSHIP—Two scholarships are awarded to students in the College of Engineering. The amount of the scholarship covers cost of tuition, books and fees not to exceed \$800 nor to be less than \$400.

WESTINGHOUSE AIR ARM DIVISION SCHOLARSHIP—The Westinghouse Electric Corporation has established a scholarship to encourage outstanding students of engineering and the physical sciences. The scholarship is awarded to a sophomore student and is paid over a period of three years in six installments of \$250. Students in electrical or mechanical engineering, engineering physics or applied mathematics are eligible for the award.

WOMEN'S CLUB OF BETHESDA SCHOLARSHIP—Several scholarships are available to young women residents of Montgomery County. Recipients must be accepted in the College of Education or the College of Nursing.

THE ARTHUR YOUNG AND CO. FOUNDATION, INC. SCHOLARSHIP—The Arthur Young and Co. Foundation, Inc., makes available a scholarship of \$750 for an exceptional senior student concentrating in accounting.

STUDENT LOANS

NDEA STUDENT LOANS—Loan funds are available under provision of the National Defense Education Act. The borrower must sign a note for the loan and agree to interest and repayment terms established by the University. Repayment of the loan begins nine months after the borrower ceases to be a full-time student and must be completed within ten years thereafter. No interest is charged on the loan until the beginning of the repayment schedule. Interest after that date is to be paid at 3 percent per annum.

The National Defense Education Act contains a provision which provides that up to fifty percent of a student loan plus interest may be cancelled in the event the borrower becomes a full time elementary or secondary school teacher. Such cancellation is to be at the rate of 10 percent a year to five years.

NURSING STUDENT LOANS—Loans up to \$1000 per year are available under provisions of the Nurses Training Act of 1964. The borrower must be a full-time student in pursuit of a baccalaureate or graduate degree in nursing, and able to establish financial need. Repayment begins one year after the borrower ceases to be a full-time student and must be completed within ten years thereafter. No interest is charged until the beginning of the repayment schedule. Interest after that date is to be paid at the rate of three percent per annum, or the "going Federal rate," whichever is greater.

Up to fifty percent of the loan plus interest may be cancelled in the event that the borrower is employed full-time as a nurse in a public or nonprofit institution or agency. Such cancellation is at the rate of ten percent per year. In the event of total or permanent disability or death, the borrower's obligation is automatically cancelled.

CATHERINE MOORE BRINKLEY LOAN FUND—Under the will of Catherine Moore Brinkley, a loan fund is available for worthy students who are natives and residents of Maryland.

KEA STUDENT LOAN FUND—A loan fund has been established by gifts from Mr. & Mrs. Paul H. Kea. The purpose of the fund is to make non-interest bearing loans of an emergency nature to students who are helping to earn the expenses of their education.

JOSEPH W. KINGHORN AND MORLEY A. JULL FUNDS—Memorial trust funds have been established in honor of Joseph W. Kinghorn, first graduate of the University of Maryland Poultry Department. These funds are available as loans to students enrolled in the Poultry Department.

EDNA B. MC NAUGHTON MEMORIAL LOAN FUND—This fund has been established by Mrs. W. B. Clayton in memory of Edna B. McNaughton, who initiated and developed the program in Early Childhood Education at the University of Maryland. Priority is given to students enrolled in this program.

PHI DELTA GAMMA LOAN FUND—This fund has been established under essentially the same terms and conditions as the NDEA loans. Recipients must be recommended by the Sigma Chapter of the Phi Delta Gamma Sorority.

JAN STEVEN AND SIDNEY RAPKE MEMORIAL LOAN FUND—This fund has been established in memory of Jan Steven Rapke by his parents. Short-term, interest free loans are available to students in good standing to meet personal emergencies as they arise. It is the wish of the donors that the fund be administered with a minimum of formality.

UNITED STUDENT AID FUNDS—Loans up to \$1,000 per year are available from many banks to students at the University. Maximum interest on such loans is 6 per cent simple. Monthly installments are usually not less than \$25 nor more than \$100. Repayment begins ten months after the student ceases to be a full time student.

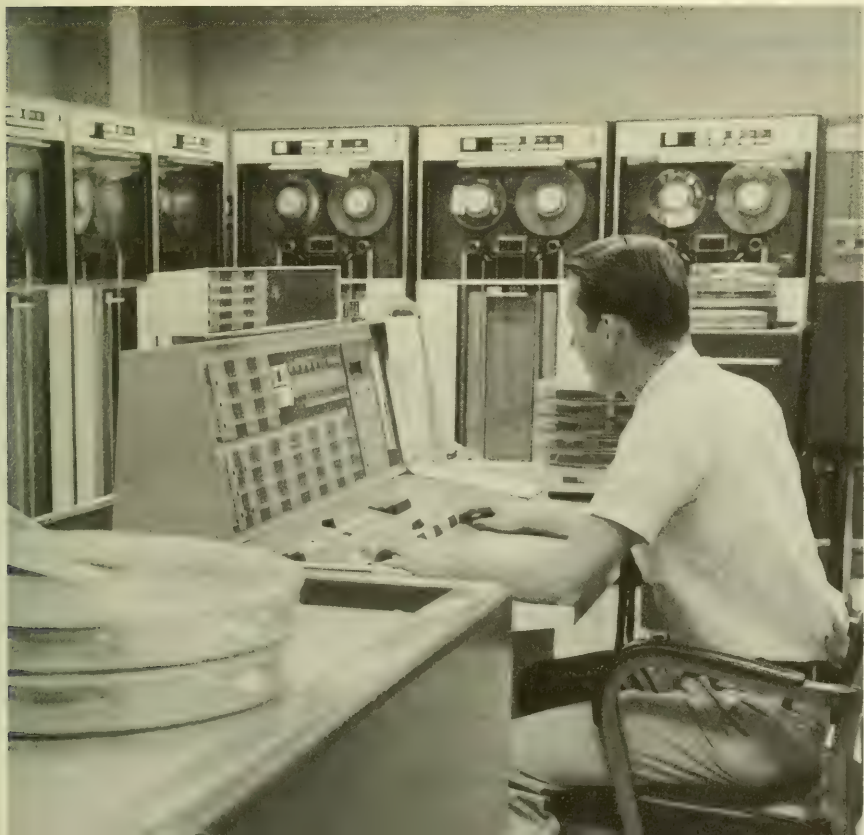
SIEGFRIED E. WEISBERGER, JR. MEMORIAL FUND—A memorial trust fund has been established in honor of Siegfried Weisberger, Jr., a Freshman student in Agriculture in 1958-59. Under terms of this loan, students in Agriculture may borrow money without interest for short term needs.

PART-TIME EMPLOYMENT

UNIVERSITY EMPLOYMENT—The University offers dining hall and dormitory workshops permitting selected Maryland residents to earn part or all of their board and room. Other jobs on campus pay hourly rates according to the skill and education required.

OFF-CAMPUS EMPLOYMENT—A file of off-campus part-time jobs is maintained. Most of these are with local stores and business firms.

COLLEGE WORK-STUDY PROGRAM—Eligible students may seek employment under provisions of Title 1-C of the Economic Opportunity Act. Part-time employment during the school year plus full-time employment during the summer may be combined with scholarships and loans to provide educational opportunities to qualified students.



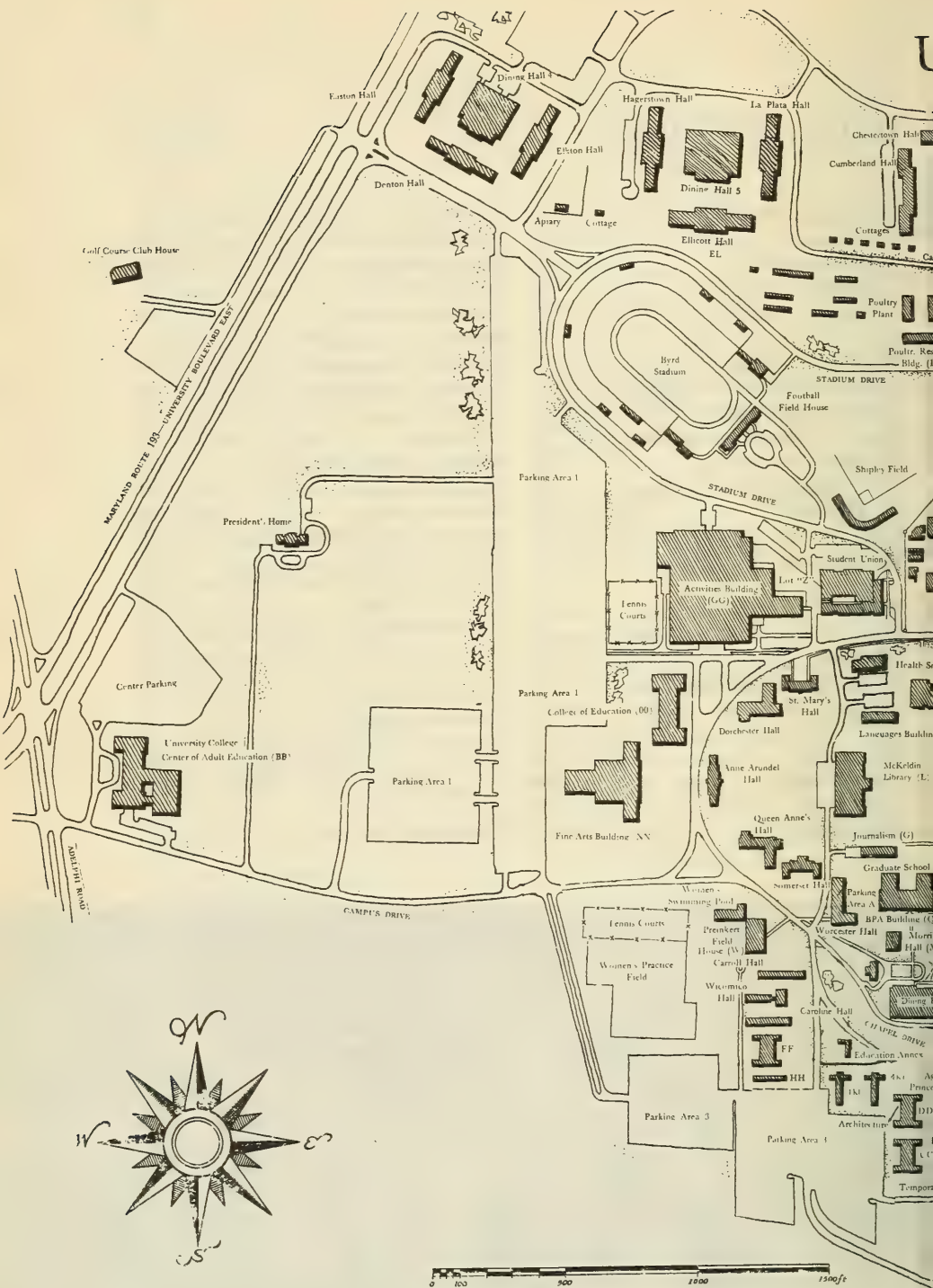
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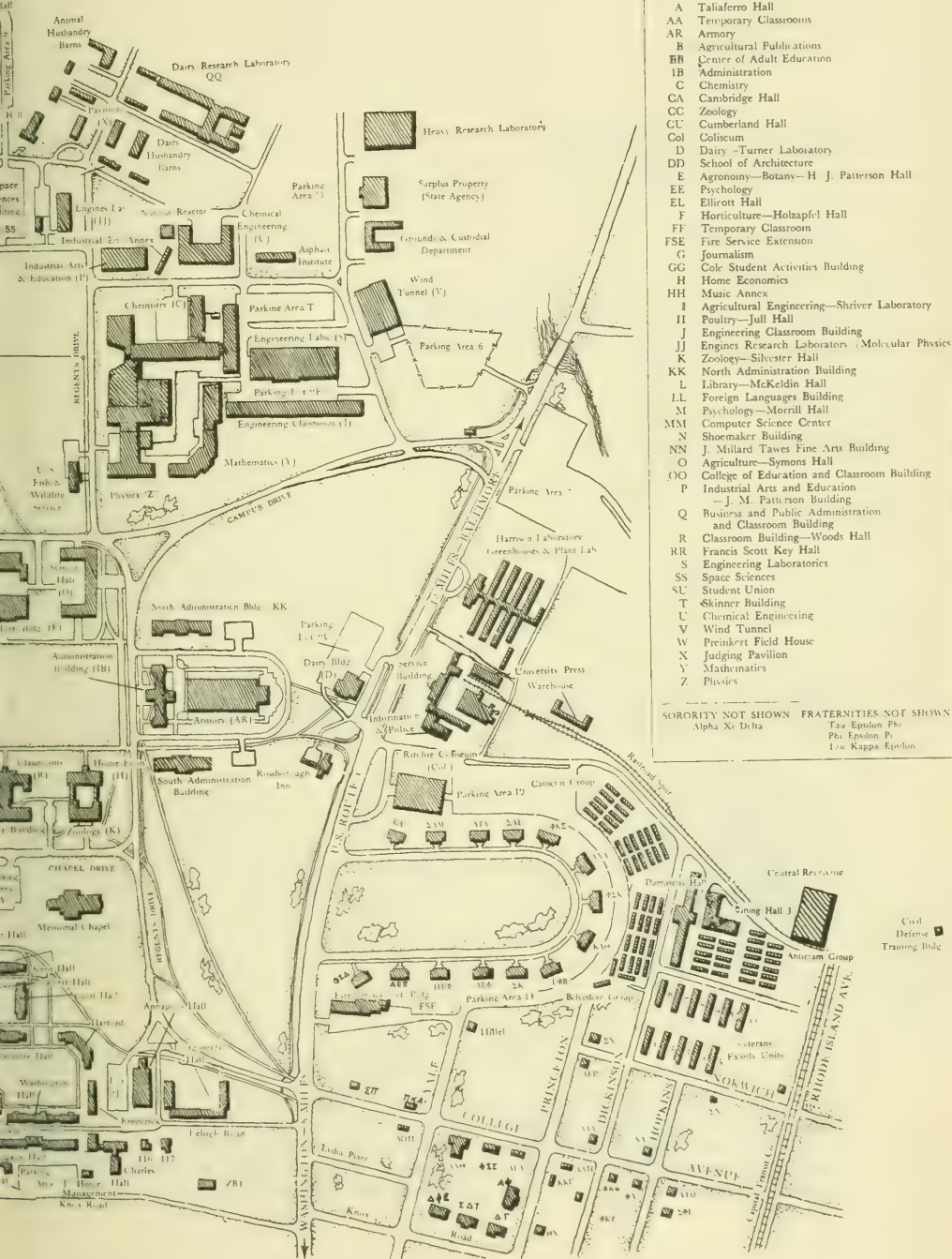
UNIVERSITY OF MARYLAND

College Park Campus

BUILDING CODE LETTERS FOR CLASS SCHEDULES

A	Taliaferro Hall
AA	Temporary Classrooms
AR	Armory
B	Agricultural Publications
BE	Center of Adult Education
IB	Administration
C	Chemistry
CA	Cambridge Hall
CC	Zoology
CU	Cumberland Hall
Col	Coliseum
D	Dairy—Turner Laboratory
DD	School of Architecture
E	Agronomy—Botany—H. J. Patterson Hall
EE	Psychology
EL	Ellis Hall
F	Horticulture—Holzapfel Hall
FF	Temporary Classroom
FSE	Fire Service Extension
G	Journalism
GG	Cole Student Activities Building
H	Home Economics
HH	Music Annex
I	Agricultural Engineering—Shriver Laboratory
II	Poultry—Jull Hall
J	Engineering Classroom Building
JJ	Engines Research Laboratory (Molecular Physics)
K	Zoology—Silvester Hall
KK	North Administration Building
L	Library—McKeldin Hall
LL	Foreign Languages Building
M	Psychology—Morrill Hall
MM	Computer Science Center
N	Shoemaker Building
NN	J. Millard Tawes Fine Arts Building
O	Agriculture—Symons Hall
OO	College of Education and Classroom Building
P	Industrial Arts and Education—J. M. Patterson Building
Q	Business and Public Administration and Classroom Building
R	Classroom Building—Woods Hall
RR	Francis Scott Key Hall
S	Engineering Laboratories
SS	Space Sciences
SU	Student Union
T	Skinner Building
U	Chemical Engineering
V	Wind Tunnel
W	Preinert Field House
X	Judging Pavilion
Y	Mathematics
Z	Physics

SORORITY NOT SHOWN FRATERNITIES NOT SHOWN
Alpha Xi Delta Tau Epsilon Phi
Phi Epsilon Phi Iota Kappa Epsilon



COLLEGE
OF
AGRICULTURE

1968-1970

THE UNIVERSITY OF MARYLAND

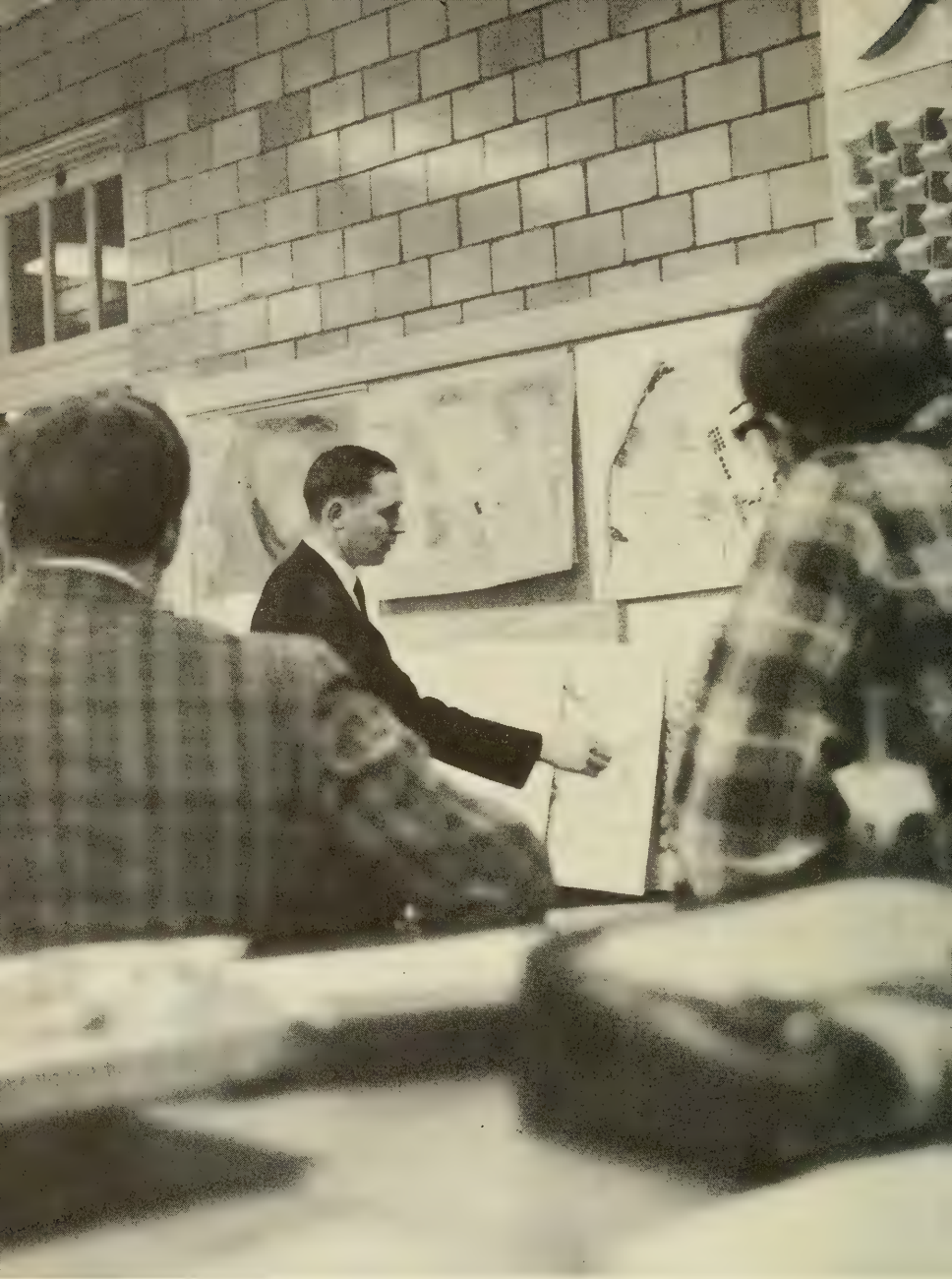


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University Calendar 1968-1969

SPRING SEMESTER, 1968

FEBRUARY	5-9	Monday-Friday	Spring Semester Registration
	12	Monday	Instruction begins
	22	Thursday	Washington's Birthday, holiday
APRIL	11	Thursday	After last class—Easter recess begins
	16	Tuesday	8:00 a.m.—Easter recess ends
MAY	29	Wednesday	Last Class Meetings
	30	Thursday	Memorial Day, holiday
	31-June 7	Friday-Friday	Spring Semester Examinations
JUNE	8	Saturday	Commencement Exercises

SUMMER SCHOOL, 1968

JUNE	24-25	Monday-Tuesday	Summer School Registration
	26	Wednesday	Instruction begins
JULY	4	Thursday	Independence Day, holiday
	6	Saturday	Classes (Thursday schedule)
AUGUST	16	Friday	Summer School ends

SHORT COURSES, 1968

JUNE	17-21	Monday-Friday	College Week for Women
AUGUST	5-9	Monday-Friday	4-H Club Week
SEPTEMBER	3-6	Tuesday-Friday	Firemen's Short Course

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m.—Christmas recess ends
	15	Wednesday	After last class—end of instruction
	17-24	Friday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
APRIL	3	Thursday	After last class—Spring recess begins
	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
	23-25	Monday-Wednesday	State Vocational Agriculture Teachers Conference
AUGUST	5-8	Tuesday-Friday	Maryland 4-H Conference
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

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GENERAL COMMITTEE ON STUDENT LIFE, WELFARE, RIGHTS AND RESPONSIBILITIES

ADJUNCT COMMITTEES: STUDENT ACTIVITIES
 FINANCIAL AIDS AND SELF-HELP
 STUDENT PUBLICATIONS AND COMMUNICATIONS
 RELIGIOUS LIFE
 STUDENT HEALTH AND SAFETY
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ADMISSIONS AND SCHOLASTIC STANDING

INSTRUCTIONAL PROCEDURES

SCHEDULING AND REGISTRATION

PROGRAMS, CURRICULA AND COURSES

FACULTY RESEARCH

PUBLIC FUNCTIONS AND COMMENCEMENTS

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UNIVERSITY PUBLICATIONS

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THE FUTURE OF THE UNIVERSITY



GORDON M. CAIRNS, DEAN

The College

THE COLLEGE OF AGRICULTURE OFFERS AN EDUCATIONAL PROGRAM DESIGNED to prepare students for careers in agricultural sciences, agricultural technology and agricultural business. Students receive a basic fundamental and cultural education, correlated with technical agricultural courses and related sciences.

The College of Agriculture is the oldest division of the University of Maryland at College Park. The institution was chartered in 1856 under the name of the Maryland Agricultural College. For three years the College was under private management. When Congress passed the Land Grant Act in 1862, the General Assembly of Maryland accepted it for the State and named the Maryland Agricultural College as the beneficiary. When the institution was merged in 1920 with the University of Maryland in Baltimore, the College of Agriculture took its place as one of the major divisions of this larger, more comprehensive organization.

In addition to teaching, the College of Agriculture includes the Agricultural Experiment Station and the Extension Service. They were established as the result of acts passed by Congress in 1887 and 1914 respectively. A more complete description of these two services appears later in this bulletin.

GENERAL INFORMATION

Graduates of the College of Agriculture are trained for employment in scientific areas related to agriculture, in agricultural business and industry or with a local, state or Federal agency. Curricula in the College of Agriculture provide for broad training in cultural and scientific courses as well as in courses related to various areas of agricultural specialization. Programs are offered for: (1) those planning to pursue the agricultural sciences and who plan to do graduate study; (2) those planning to pursue the business activities in agricultural and related industries, and (3) those planning to pursue the technology of animal and plant production, the engineering, chemistry, and food processing of agricultural products as well as teaching, research and extension in agriculture.

Many professors conduct research studies in their respective disciplines. Through these studies the frontiers of knowledge are constantly being extended. These new findings are incorporated in courses thereby enriching the instruction in a dynamic agriculture.

The close relationship of extension specialists and extension agents with farmers and farm families enables workers in the College to evaluate the agricultural situation. New agricultural problems are brought to the attention of the research worker and new developments are presented to farmers and their families.

The coordination of teaching, research and extension provides effective educational opportunities for students in the College. Many professors contribute to the research and extension programs concerned with agriculture and food production, the development of new varieties and processing procedures, as well as adjustments in agricultural production and marketing.

Workers in the College of Agriculture, through regulatory and service activities, are constantly working with actual problems associated with the improvement and maintenance of standards for farm products. Regulatory and control work extends over a wide range of activities and concerned with reducing losses due to insect pests and diseases; preventing and controlling serious outbreaks of diseases and pests of animals and plants; analyzing fertilizer, feed and lime for guaranteed quality; and analyzing and testing germination quality of seeds to insure better seeds for farm planting. Marketing services include Federal-state inspection, fresh egg law, dairy inspection, seed inspection, weight and measures and market news service.

Special Advantages

The University of Maryland is within a few miles of the Agricultural Research Center of the United States Department of Agriculture. This is the largest, best manned, and best equipped agriculture research agency in the world. Also, the University of Maryland is within a few miles of the Washington, D. C., offices of the Department of Agriculture and other government departments, including the Library of Congress. Students can easily visit these agencies and become acquainted with their work. Such contacts have proved valuable to many University of Maryland graduates.

Also, it is not uncommon for men from these agencies to speak before classes at the University and to be guest speakers at student club meetings and otherwise take part in student activities. No other college of agriculture in the United States is physically located to offer like opportunities to its students.

Coordination of Agricultural Work

The strength of the College of Agriculture of the University of Maryland lies in the close coordination of the instructional, research, extension, and regulatory functions within the individual departments, between the several departments, and in the institution as a whole. Instructors in the several departments are closely associated with the research, extension and regulatory work being carried on in their respective fields, and in many cases, devote a portion of their time to one or more of these types of activities. Close coordination of these four types of work enables the University to provide a stronger faculty in the College of Agriculture, and affords a higher degree of specialization than would otherwise be possible. It insures instructors an opportunity to keep informed on the latest results of research, and to be constantly in touch with current trends and problems which are revealed in extension and regulatory activities. Heads of departments hold staff conferences to this end, so that the students at all times is as close to the developments in the frontiers of the several fields of knowledge as it is possible for an organization to put him.

Facilities and Equipment

In addition to buildings, laboratories, libraries, and equipment for effective instruction in the related basic sciences and in the cultural subjects, the University of Maryland is provided with excellent facilities for research and instruction in agriculture. University farms, totaling more than 2,000 acres, are operated for instructional and investigational purposes. One of the most complete and modern plants for dairy and animal husbandry work in the country, together with herds of the principal breeds of dairy and beef cattle, and other livestock, provides facilities and materials for instruction and research in these industries. Excellent laboratory and field facilities are available in the Agronomy Department for breeding and selection in farm crops, and for soils research. The Poultry Department has a building for laboratories and classrooms, a plant comprising twenty acres, and flocks of the important breeds of poultry. A research farm is available for experimental testing under field conditions. The Horticulture Department is housed in a separate building, and has ample orchards, gardens and greenhouses for its various lines of work. A research farm is located near Salisbury where experimental work is carried on in the area of intense production. The Botany Department has excellent facilities available in laboratories, greenhouses, and field space for research in most phases of botany, especially in plant pathology, plant physiology, cytology and cytogenetics. A powerful X-ray machine, ultra centrifuge, and an electron microscope are the major pieces of equipment available; facilities for use of radio-isotopes are available for both teaching and research.

Costs

Actual annual costs of attending the University include: \$300.00 fixed charges; \$104.00 special fees; \$480.00 board; \$3,40.00 lodging for Maryland residents, or \$440.00 for residents of other states and countries. A charge of \$450.00 is assessed to all students who are non-residents of the State of Maryland.

A matriculation fee of \$10.00 is charged all new students. A fee of \$10.00 must accompany a prospective student's application for admission. If a student enrolls for the term for which he applied, the fee is acceptable in lieu of the matriculation fee. An enrollment deposit fee of \$50.00 will be required of all full-time students entering for the first time.

An Adventure in Learning, the undergraduate catalog of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park, Maryland 20742.

Air Science

The Department of Air Science offers an entirely voluntary program of instruction. A two year program and a four year program are available. These programs are designed to fulfill the needs of eligible college male students who begin higher education at either a junior college or a four year college. The

successful completion of either program qualifies the student for a reserve commission in the United States Air Force upon graduation.

For further details concerning Air Science, refer to *University General and Academic Regulations*, a publication available to all undergraduate students.

Scholarships and Grants-in-Aid

A limited number of scholarships are available for agricultural students. These include awards granted by the Borden Company, Dr. Ernest N. Cory Trust Fund, the Danforth Foundation, the Ralston Purina Company, Southern States Cooperative, Inc., Bayshore Foods, Inc., Dairy Technology Society of Maryland and District of Columbia, and Peninsula Horticultural Society.

These scholarships and grants-in-aid are awarded by the Faculty Committee in accordance with the terms of the respective grants. More detailed information about these awards is contained in the publication *An Adventure in Learning*.

Student Organizations

Students find opportunity for varied expression and growth in the several voluntary organizations sponsored by the College of Agriculture. These organizations are: Agricultural Economics Club, Block and Bridle, Dairy Science Club, Collegiate 4-H Club, Future Farmers of America, Agronomy Club, and the Veterinary Science Club.

Alpha Zeta is a national agricultural honor fraternity. Members are chosen from students in the College of Agriculture who have attained the scholastic requirements and displayed leadership in agriculture.

The Agricultural Student Council is made up of representatives from the various student organizations in the College of Agriculture. Its purpose is to coordinate activities of these organizations and to promote work which is beneficial to the College.

Student Judging Teams

The College of Agriculture sponsors judging teams for dairy cattle, dairy products, horticultural products, livestock, meats, poultry and land. Team members are selected from students taking courses designed especially to train them for this purpose. Teams are entered in major contests where students compete with teams from other state universities or agricultural colleges.

For Additional Information

Detailed information concerning the General Education Program, fees and expenses, scholarships and awards, student life, and other material of a general nature, may be found in the University publication titled *An Adventure in Learning*. This publication may be obtained on request from the Catalog Mailing Office, North Administration Building, University of Maryland at College

Park, 20742. A detailed explanation of the regulations of student and academic life, may be found in the University publication titled, *University General and Academic Regulations*.

Requests for course catalogs for the individual schools and colleges should be directed to the deans of those respective units, addressed to:

COLLEGES LOCATED AT COLLEGE PARK:

Dean
(College in which you are interested)
The University of Maryland
College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean
(School in which you are interested)
The University of Maryland
Lombard and Green Streets
Baltimore 1, Maryland 21201

Awards

ALPHA ZETA MEDAL

The honorary agricultural fraternity of Alpha Zeta awards annually a medal to the agricultural student in the freshman class who attains the highest average record in academic work. The presentation of the medal does not elect the student to the fraternity, but simply indicates recognition of high scholarship.

AGRICULTURE ALUMNI SENIOR AWARD

This award is presented to a member of the senior class who during his collegiate career most nearly typified the model student and contributed most toward the advancement of the College of Agriculture of the University of Maryland.

APPLEMAN-NORTON AWARD

This award is made annually to a senior for excellence in botany.

CARROLL E. COX AWARD

This cash award is made annually to the most outstanding graduate student in the Department of Botany.

JOE E. JAMES AWARD

A gold watch is awarded annually to the outstanding senior in horticulture.

NATIONAL BLOCK AND BRIDLE AWARD

The National Block and Bridle awards annually a plaque to the member of the Block and Bridle Club who has done the most for the local club during the year.

NATIONAL PLANT FOOD INSTITUTE AWARD

National Plant Food Institute awards annually the Agronomy Achievement Award to the outstanding junior or senior student in Agronomy. The amount is \$200.

VIRGINIA DARE AWARD

The Virginia Dare Extract Company awards annually a plaque and \$25.00 to the outstanding student in ice cream manufacturing with an overall good standing in dairy.

EDGAR P. WALLS AWARD

A gold watch is awarded annually to an outstanding senior in horticultural processing.

Academic Information

Admission

FALL SEMESTER

All applications for full-time undergraduate admission for the Fall Semester at the College Park Campus must be received by the University on or before June 1. Any student registering for nine or more semester hours of work is considered a full-time student.

Under unusual circumstances, application will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. SAT scores (in the case of new freshmen) and medical examination report must be received by July 15.

SPRING SEMESTER

The deadline for receipt of applications for the Spring Semester is January 1.

UNIVERSITY COLLEGE

The application deadlines and fees *do not* apply to students registering in the evening classes offered by the University College.

GRADUATE SCHOOL

Application for admission to the Graduate School must be made by July 15 for the Fall semester, December 15 for the Spring semester and May 15 for the summer session on blanks obtained from the Office of the Graduate School.

ENTRANCE REQUIREMENTS

The high school or preparatory school student who intends to apply for admission to the University should plan his secondary school program carefully. He should select a program that will prepare him adequately to begin college work at the college level. He should allow for the fact that his interests may change by selecting a secondary school program that will enable him, when he enters the University, to have a maximum freedom of choice among the various curricula offered at the University.

Every candidate for admission to the University must normally present sixteen units of high school subjects. It is required that seven of the minimum sixteen units be in college preparatory subjects as follows:

English	4 units
Mathematics (preferably algebra)	1 unit
History or Social Sciences	1 unit
Biological or Physical Sciences	1 unit

The other units should be chosen to give the student as strong a preparation as possible for his work at the University. At least twelve of the units presented should be in college preparatory courses in academic subjects. Although there is no entrance requirement in foreign languages, two or more units are highly desirable for many programs and are suitable for all programs. Likewise it is desirable that each student offer two units in history or social sciences, and two units in the biological and physical sciences. It is strongly recommended that all students present a unit of plane geometry in addition to the one or two units of algebra.

It is recommended that the preparatory program in high school include:

English	4 units
Mathematics (college preparatory)	3 units
(Agricultural Engineering and Agricultural Chemistry—1 additional unit)	
Biological and physical sciences	3 units
History or social sciences	2 units

Two units of foreign language are recommended for students in Agricultural Engineering, Agricultural Chemistry, Botany and Entomology.

Deviation from these recommendations is permitted, but should be undertaken only upon competent advice. An unwise selection of preparatory courses can effectively prevent the student from pursuing certain curricula at the University or materially increase the time necessary to complete a particular curriculum. Every prospective applicant should be certain that his preparation in mathematics is adequate for any program he might conceivably wish to enter. A special fee will be charged for all remedial work in mathematics with the exception of the course in solid geometry.

A well-planned program of college preparatory work contributes much to the success of a student in his college work. This fact has an important bearing in estimating whether a candidate for admission is likely to be successful in his work at the University.

Junior Standing

To earn junior standing a student must complete 56 semester hours of academic credit toward his degree with at least the minimum required grade point average to remain in the university.

Requirements for Graduation

Each student must acquire a minimum of 120 semester hour credits in academic subjects with an average grade of "C" (2.0) or better. In addition requirements in health and physical education must be satisfied.

Honors Program

The Honors Program of the College of Agriculture is made up of Departmental Honors Programs. The objective of the program is to recognize superior scholarship and to provide an opportunity for the excellent student to pursue more deeply those things which will add to his usefulness as a member of society. Honors Programs will be administered by Departmental Honors Committees and will be supervised by a College Committee on Honors Programs. All students in the College of Agriculture, who are in the top 20 percent of their class at the end of their first year, will automatically be considered for admission into the Honors Program. Of this group, no more than 50 percent will be admitted. Admission of students, who are sophomores or first semester juniors, will be considered upon application from any such student who stands in the upper 20 percent of his class. While application will be considered until the student enters his sixth semester, early participation in the program is highly preferable. Students admitted to the program enjoy some academic privileges. On the basis of the student's performance, during his participation in the Honors Program, the department may recommend the candidate for the appropriate degree with (departmental) Honors, or for the appropriate degree with (departmental) High Honors. Successful completion of the Honors program will be recognized by a citation in the Commencement Program and by an appropriate entry on the student's record and diploma.

Student Advisers

Each student in the College of Agriculture is assigned to a faculty adviser, either departmental or general. Departmental advisers consist of heads of departments or persons selected by them to advise students with curricula in their respective departments. General advisers are selected for students who have no definite choice of curriculum in mind, or who wish to pursue the general curriculum in agriculture.

Electives

The electives in the suggested curricula which follow afford opportunity for those who so desire to supplement major and minor fields of study or to add to their general education.

With the advice and consent of those in charge of this registration, a student may make such modifications in his curriculum as are deemed advisable to meet the requirements of his particular need.

Field and Laboratory Practice

The head of each department will help to make available opportunities for practical or technical experience for each student whose major is in that de-

partment and who is in need of such experience. For inexperienced students in many departments this need may be met by one or more summers spent on a farm.

Freshman Year

The program of the freshman year in the College of Agriculture is similar for all curricula of the College. Its purpose is to afford the student an opportunity to lay a broad foundation in subjects basic to agriculture and the related sciences, to articulate beginning work in college with that pursued in high or preparatory schools, to provide opportunity for wise choice of programs in succeeding years, and to make it possible for a student before the end of the year to change from one curriculum to another, or from the College of Agriculture to a curriculum in some other college of the University with little or no loss of credit.

Students entering the freshman year with a definite choice of curriculum are assigned to departmental advisers for counsel and planning of an academic program. Students entering the freshman year who have not selected a definite curriculum, are assigned to a general adviser, who assists with the choice of freshman electives and during the course of the year acquaints students with opportunities in the other curricula in the College of Agriculture and in other divisions of the University. If by the close of the freshman year a student makes no definite choice of a specialized curriculum, he continues under the guidance of his general adviser in the General Agriculture curriculum.

Required Courses

AGRICULTURE CURRICULUM

All students in the College of Agriculture are required to complete a series of courses to satisfy University requirements, College requirements and departmental requirements. The training courses needed to complete a program of study are selected by the student with the approval of his adviser.

UNIVERSITY REQUIREMENTS	<i>Semester Credit Hours</i>
ENGL 1 or 21—Composition or Honors Composition	3
ENGL 3, 4—World Literature	6
Social Science	6
History	6
Mathematics	3
Fine Arts or Philosophy	3
HLTH 5—Science and Theory of Health	2
Physical Education	2
Air Science (Optional)	

COLLEGE OF AGRICULTURE REQUIREMENTS

CHEM 1, 3—General Chemistry	8
SPCH 7—Public Speaking	2
AGRI 1—Introduction to Agriculture	1

ELECT TWO OF THE FOLLOWING:

- BOTN 1—General Botany (4)
- ZOOL 1—General Zoology (4)
- MICB 1—General Microbiology (4)

Students failing to pass the pre-registration test in mathematics will be required to take MATH 1. (Special fee, \$45.00)

Students expecting to pursue the curriculum in either Agricultural Chemistry or Agricultural Engineering should, if qualified take MATH 18 or 19. If not qualified they should take MATH 1.

DEPARTMENT REQUIREMENTS 74

Required courses are determined by the department for each specific curriculum and elective courses are approved by the adviser of the student's program.

A program of courses for the freshman year is essentially the same for all students. However, there are some variations in several curricula.

FRESHMEN	Semester—	
	I	II
ENGL 1 or 21—Composition or Honors Composition	3	..
Social Science	3	3
AGRI 1—Introduction to Agriculture	1	..
BOTN 1—General Botany	4	..
ZOOL 1—General Zoology . . . . .	..	4
ANSC 1—Principles of Animal Science	3	..
AGON 1—Crop Production . . . . .	..	3
Mathematics . . . . .	..	3
Health	2	..
Arts or Philosophy . . . . .	..	3
Physical Education	1	1
Air Science (optional)		

AGRICULTURE—GENERAL

The general agricultural curriculum provides for the development of a broad understanding in agriculture.

The flexibility of this curriculum permits selection of electives that will meet individual vocational plans in agriculture and agriculturally related business and industry.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

GENERAL AGRICULTURAL REQUIREMENTS	Semester	
	Credit	Hours
AGEC 107—Financial Analysis of the Farm Business	3	
AGEC 108—Farm Management	3	
RLED 114—Rural Life and Education	3	
AGEN 56—Introduction to Farm Mechanics	2	
AGEN 1—Introduction to Agricultural Engineering	4	
AGRO 10—General Soils	4	
AGRO 107—Cereal Crop Production	3	
AGRO 108—Forage Crop Production	3	
AGRO 151—Cropping System	2	
ANSC 1—Principles of Animal Science	3	
ANSC 10—Feeds and Feeding	3	
BOTN 20—Diseases of Plants	4	
ANSC 40—Dairy Production	3	
ENTM 20—Insect Pests of Agricultural Crops	4	
HORT 5 or 58—General Horticulture	3	
ANSC 62—Commercial Poultry Management	3	
Elect either of the following pairs of courses:		
MICB 1 and BOTN 117	6	
BSAD 20, 21—Principles of Accounting	6	
Electives	20	

AGRICULTURAL ECONOMICS

The curriculum combines training in the business, economics, and international aspects of agricultural production and marketing with the biological

and physical sciences basic to agriculture. Programs are available for students in agricultural economics, agricultural business, international agriculture and in agribusiness teaching. Students desiring to enter agricultural marketing or businesses affiliated with agriculture may elect the agricultural business option; and students interested in foreign service may elect the international agriculture option. Students primarily interested in the broad aspects of production and management as it is related to the operation of a farm business may elect the agricultural economics option. Students interested in training in agribusiness and also interested in becoming certified teachers should elect the agribusiness teaching option. In these programs, students are trained for employment in agricultural business firms for positions in sales or management, for local, state, or federal agencies, extension workers, high school and college teachers, researchers, farm operators or farm managers.

Courses for the freshman and sophomore years are essentially the same for all students. In the junior year the student selects the agricultural economics, agricultural business, international agriculture, or agribusiness teaching option according to his particular interest. Courses in this Department are designed to provide training in the application of economic principles to the production, processing, distribution, and merchandising of agricultural products as well as the inter-relationship of business and industry associated with agricultural products. The curriculum includes courses in general agricultural economics, marketing, farm management, prices, resource economics, agricultural policy, and international agricultural economics.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

	<i>Credit Hours</i>
REQUIRED OF ALL STUDENTS	
AGEC 050—Elements of Agricultural Economics	3
AGEC 051—Marketing of Agricultural Products	3
AGEC 106—Prices of Agricultural Products	3
AGEC 108—Farm Management	3
AGEC 112—Agricultural Policy and Programs	3
AGEC 114—World Agricultural Production and Trade	3
AGEC 199—(A or B) Seminar	1
AGEN 001—Introduction to Agricultural Engineering	4
AGRO 001—Crop Production	4
or	
AGRO 010—General Soils	4
ANSC 001—Principles of Animal Science	3
or	
ANSC 010—Feeds and Feeding	3
BSAD 130—Business Statistics I	3
or	
AGRI 080—Introductory Agricultural Biometrics	3
ECON 032—Principles of Economics II	3
MATH 011—Introduction to Mathematics	3

SELECT A MINIMUM OF 6 HOURS FROM THE FOLLOWING:

ECON 102—National Income Analysis	3
ECON 130—Mathematical Economics	3
ECON 131—Comparative Economic Systems	3
ECON 132—Intermediate Price Theory	3
ECON 140—Money and Banking	3

AGRICULTURE BUSINESS OPTION—After consulting the advisor, select at least 15 credit hours from the following:

AGEC 103—Introduction to Agricultural Business Management	3
AGEC 107—Financial Analysis of Farm Businesses	3
AGEC 115—Marketing of Animal and Animal Products	3
AGEC 116—Marketing of Plant Products	3
BSAD 020—Principles of Accounting I	3
BSAD 021—Principles of Accounting II	3
BSAD 149—Marketing Principles and Organization	3
BSAD 150—Marketing Management	3
BSAD 151—Advertising	3
BSAD 180—Business Law	3

AGRICULTURAL ECONOMICS OPTION—After consulting with your advisor, select at least 9 credit hours from the following:

AGEC 103—Introduction to Agricultural Business Management	3
AGEC 111—Economics of Resource Development	3
AGEC 107—Financial Analysis of the Farm Business	3
BSAD 020—Principles of Accounting I	3
BSAD 021—Principles of Accounting II	3
BSAD 180—Business Law	3

AGRIBUSINESS TEACHING OPTION—Students must complete each of the following:

EDUC 110—Human Development and Learning	6
EDUC 111—Foundations of Education	3
RLED 101—Teaching Materials and Demonstrations	2
RLED 103—Student Teaching	5
RLED 104—Student Teaching	1-4
RLED 107—Introduction to Agricultural Education	3
RLED 109—Teaching Secondary Vocational Agriculture	3
RLED 111—Teaching Young and Adult Farmer Groups	3
RLED 114—Rural Life in Modern Society	3

Students may elect remaining courses from Agricultural Sciences or Social Sciences 7

INTERNATIONAL AGRICULTURE OPTION—After consulting with advisor, students should select at least 10 credit hours from the following:

AGEC 103—Introduction to Agricultural Business Management	3
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AGEC 111—Economics of Resource Development	3
AGEC 119—Foreign Agricultural Economics	3
BOTN 020—Diseases of Plants	3
BOTN 117—General Plant Genetics	3
ENTM 015—Introductory Entomology	3
GEOG 010—General Geography	3
GEOG 041—Climatology	3
GEOL 001—Geology	3
.....—Foreign Language	6

AGRICULTURAL CHEMISTRY

This curriculum insures adequate instruction in the fundamentals of both the physical and biological sciences. It may be adjusted through the selection of electives to fit the student for work in agricultural experiment stations, soil bureaus, geological surveys, food laboratories, fertilizer industries and those handling food products.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

REQUIRED OF ALL STUDENTS	Semester	
	Credit	Hours
CHEM 15—Qualitative Analysis	4	
CHEM 21—Quantitative Analysis	4	
CHEM 35—Elementary Organic Lecture	2	
CHEM 36—Elementary Organic Laboratory	2	
CHEM 37—Elementary Organic Lecture	2	
CHEM 38—Elementary Organic Laboratory	2	
CHEM 123—Advanced Quantitative Analysis or	3	
CHEM 121—Intermediate Quantative Analysis	4	
AGRO 10—General Soils	4	
BOTN 1—General Botany	4	
GEOL 1—Geology	3	
MATH 20—Calculus I	4	
MATH 21—Calculus II	4	
Modern Languages	12	
PHYS 19—General Physics	3	
PHYS 20—General Physics	4	
PHYS 21—General Physics	4	
SPCH 7—Public Speaking	2	
ZOOL 1—General Zoology	4	
Electives in Biology	6	
Electives in Agricultural Chemistry	9	

AGRICULTURAL AND EXTENSION EDUCATION

This Department combines a broad general training in agriculture with basic work in the natural sciences, the social sciences and the humanities.



Programs are available for students in agricultural education and agricultural extension education. The agricultural education curriculum is designed primarily for persons who wish to prepare for teaching agriculture in secondary schools. The agricultural extension curriculum is designed primarily for persons who desire to prepare to enter the Cooperative Extension Service. By completing six semester hours of physics, agricultural education majors may also qualify for certification to teach general science in the public schools of Maryland. Either option may lead to a variety of other educational career opportunities in agricultural business and industry, public service, the communications industry, and to research and college teaching. Students interested in rural ministry often select this curriculum.

In addition to the regular entrance requirements of the University, involving graduation from a standard four-year high school, students electing either curriculum must present evidence of having acquired adequate agricultural experience after reaching the age of fourteen years, or plan to secure it prior to graduation.

In order to be admitted to student teaching or to extension field experience, each of which normally is taken in the senior year, a student must have a 2.3 grade point average or higher.

Students in the agricultural education curriculum are expected to participate in the Collegiate Chapter of the Future Farmers of America in order to gain needed training to serve as advisers of high school chapters of the FFA upon graduation.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENTAL REQUIREMENTS, BOTH OPTIONS	Semester Credit Hours
ANSC 1—Principles of Animal Science	3
ANSC 10—Feeds and Feeding	3
AGRO 1—Crop Production, or	
AGRO 108—Forage Crop Production	3
AGRO 10—General Soils	4
AGEN 1—Introduction to Agricultural Engineering	4
AGEC 107—Financial Analysis of the Farm Business, or	
AGEC 108—Farm Management	3
RLED 114—Rural Life in Modern Society	3
RLED 101—Teaching Materials and Demonstrations	2
ENTM 20—Insect Pests of Agricultural Crops	4
BOTN 20—Diseases of Plants	4
HORT 11—Greenhouse Management, or	
HORT 58—Vegetable Production, or	
HORT 62—Plant Propagation	3
ENGL 14—Expository Writing	3

AGRICULTURAL EDUCATION OPTION

RLED 103—Student Teaching	5
RLED 104—Student Teaching	1-4
RLED 107—Introduction to Agricultural Education	2

RLED 109—Teaching Secondary Vocational Agriculture	3
RLED 111—Teaching Young and Adult Farmer Groups	1
EDUC 110—Human Development & Learning	6
EDUC 111—Foundations of Education	3
AGEN 56—Introduction to Farm Mechanics	2
AGEN 104—Farm Mechanics	2
Approved Electives	12

AGRICULTURAL EXTENSION OPTION

RLED 150—Extension Education	2
RLED 160—Extension Communications	2
RLED 161—4-H Organization and Procedure	2
RLED 121—Directed Experience in Extension Education	1-5
PSYC 1—Introduction of Psychology	3
PSYC 21—Social Psychology	3
PSYC 110—Educational Psychology	3
AGEC 111—Economics of Resource Development	3
Approved Electives	18

AGRICULTURAL ENGINEERING

Agricultural engineering, in the broadest sense, is the science of combining forces and materials of nature for the benefit of agriculture; as implied, an understanding of soil, plant, and animal sciences is the basis for intelligent applications of engineering principles in all phases of the agricultural industry. Because interrelated applications of all branches of engineering are found in agriculture, or even on a single, diversified farm, education for the profession is necessarily founded on a broad base of mathematical, physical and engineering science complemented by basic agricultural sciences. Although boundaries between generally recognized fields of engineering overlap in agricultural applications, the scope of the field together with personal preference generally leads to specialization in one of the four major areas of the profession. Students completing the curriculum are awarded a Bachelor of Science degree in Agricultural Engineering.

Electric power and processing is concerned with productive applications of electricity in farm production and in other phases of the agricultural industry. Electricity is used not only for light and power but also for heating and cooling processes and for automatic control and operation of equipment. Agricultural engineers with such interests are employed by electric power suppliers and crop processing organizations.

Farm structures specialists are interested in farm buildings for structural design and functional use. Environmental requirements of animal shelters, crop storage and processing structures include control of temperature, humidity, and air movement of efficient utilization. Design must accommodate heat and moisture of respiration from animal or vegetable origin. Manufacturers and fabricators of structural units and facilities employ agricultural engineers for research and educational programs to promote their products.

Agricultural engineers specializing in soil and water control and conservation utilize hydraulics in irrigation, drainage, and soil erosion. Knowledge of

how water flows over or through soil or infiltrates into soil are the tools of the engineer, but use of these tools is influenced by soil-moisture-plant relationship.

Farm management companies employ engineers to design soil and water conservation and other engineering systems for farms under their supervision or for individual farmers. Other sources of employment include contracting, farm management, irrigation equipment design or sales and service, and related enterprises.

State and federal institutions and agencies conduct programs of education and research in all areas of agricultural engineering. Research findings are frequently established in the agricultural industry through programs of action agencies such as the Agricultural Extension Service or the Soil Conservation Service. The agencies offer many opportunities for work in the field.

The Department also offers an educational program in agricultural engineering technology for students in the College of Agriculture. These subjects may be grouped under five general classifications, farm power and machinery, farm structures, soil and water conservation engineering, farm electrification, and mechanics and equipment for agricultural materials handling and processing. The technological aspects covered in these courses are designed to complement the education received by students in other departments of the College of Agriculture.

University Requirements (see page 25)

AGRICULTURAL ENGINEERING

FRESHMAN YEAR	Semester	
	I	II
AGRI 1—Introduction to Agriculture	1	..
CHEM 1—General Chemistry	4	..
CHEM 3—General Chemistry .....	..	4
ENES 1 or 2—Introductory Engineering Science	3	..
ENES 10—Introductory Mechanics .....	..	3
MATH 19—Elementary Analysis ¹	4	..
MATH 20—Calculus I .....	..	4
PHYS 30—General Physics .....	..	3
General Education Course	3	3
HLTH 5—Science and Theory of Health	2	..
PHED 1—Orientation to Physical Education	1	..
PHED 3—Development and Combative Sports .....	..	1
	<hr/> 18	<hr/> 18

AGRICULTURAL SCIENCES

AGRI 1—Introduction to Agriculture	1
AGRO 1—Crop Production	3
AGRO 10—General Soils	4
AGRO 117—Soil Physics (Required in Series A Tech. Electives)	(3)

AGRICULTURAL ENGINEERING

AGEN 1—Introduction to Agricultural Engineering	4
AGEN 86—Agricultural Engineering Shop Techniques	1

AGEN 143—Agricultural Power and Machinery Analysis	4
AGEN 144—Design of Operational Systems for Agriculture . .	3
AGEN 145—Soil and Water Conservation Engineering	2
AGEN 189—Senior Problem	2

BASIC SCIENCES

CHEM 1, 3—General Chemistry	8
MATH 19—Elementary Analysis ¹	4
MATH 20, 21, 22—Calculus I, II, III	12
MATH 66 or ENME 116—Applied Mathematics in Engineering or ENCE 112—Applied Mathematics in Engineering	3
PHYS 30, 31, 32—General Physics	11

GENERAL EDUCATION

See University requirements, page 25.

GENERAL ENGINEERING

	<i>Semester Credit Hours</i>
ENES 1 or 2—Introductory Engineering Science	3
ENES 10—Introductory Mechanics	3
ENES 20—Mechanics of Materials	3
ENES 21—Dynamics	3
ENCE 90—Engineering Survey Measurements	3
ENCE 105 or ENME 102—Fluid Mechanics	3
ENEE 60, 62—Principles of Electrical Engineering	6
ENEE 61, 63—Electrical Engineering Laboratory	2
ENME 1—Thermodynamics I	3

TECHNICAL ELECTIVES

Students will select Series A, B, or C.

Series A

ENCE 50—Fundamentals of Engineering Materials	3
ENCE 102—Fundamentals of Structural Analysis	3
ENCE 103—Basic Structural Design	3
ENCE 165—Structural Analysis	3
ENCE 166—Structural Design	4

NOTE: Students selecting Series A to take AGRO 117

Series B

ENES 30—Materials Science	3
ENCE 102—Fundamentals of Structural Analysis	3

¹ Students who are not prepared to schedule MATH 19 based on the ACT test scores are advised to schedule MATH 1. (Special fee, \$45.00).

ENCE 103—Basic Structural Design	3
ENME 101—Dynamics of Machinery	2
ENME 103—Materials Engineering	3
ENME 106—Transfer Processes	3
Elective	3

Series C

ENES 30—Materials Science	3
ENCE 102—Fundamentals of Structural Analysis	3
ENCE 103—Basic Structural Design	3
ENEE 122—Electronic Circuits I	4
ENEE 123—Electronics Laboratory I	1
Elective	3

NOTE: Students selecting Series C will take ENEE 90, 91, 120, 121 in lieu of ENEE 60, 61, 62, 63. (adds 2 hrs.) 2

AGRONOMY—CROPS, SOILS, AND GEOLOGY

The Department of Agronomy offers instruction in production and breeding of forage crops, cereal crops, and tobacco; weed control; turf management; soil chemistry; soil fertility; soil physics; soil mineralogy; soil classification; and soil conservation. A technical or a general curriculum may be elected by a student in either crops or soils. A turf option is available in the general crops curriculum and a soil conservation option is available in the general soils curriculum. The technical curricula provide training in basic courses which will increase the student's understanding of the applied crops and soils courses. Training in these basic courses is required for advanced work in agronomy and is desired by many employers of students graduating in agronomy.

General curricula in crops and soils permit the student to confine his training to applied courses but students following these curricula are encouraged to elect some of the basic courses included in the technical curricula.

Depending on the electives chosen, students graduating in agronomy are well prepared for advanced study, trained for general farming, farm management, specialized seed production, extension work, soil conservation, or employment with commercial seed, fertilizer, chemical, or farm equipment companies. Turf specialists are in demand by park and road commissions, golf courses, and turf and landscape companies.

Students interested in geology have an excellent opportunity to prepare for advance work in this field. Basic courses in mathematics, chemistry, and physics are as necessary for outstanding geologists as they are for other scientists and engineers. Although relatively few courses are offered in geology at the present time, these courses provide the students with a good geology background while they are taking the general courses required of all the University of Maryland students as well as the basic courses necessary for excellence in geology. By the proper selection of courses listed under the technical electives (which can be substituted for other departmental required courses) the student can obtain outstanding undergraduate training for advanced work in geology.

Additional information on opportunities in agronomy and geology may be obtained by writing to the Department of Agronomy.

CROPS

University Requirements (see page 25)*College of Agriculture Requirements* (see page 25)

DEPARTMENTAL REQUIREMENTS (CROPS)

	<i>Semester Credit Hours</i>
AGRO 10—General Soils	4
AGRO 107—Cereal Crop Production	3
AGRO 108—Forage Crop Production	3
AGRO —Advanced Soils Courses	6
AGRO 199—Senior Seminar	1
BOTN 11—Plant Taxonomy	3
BOTN 20—Diseases of Plants	4
BOTN 117—General Plant Genetics or	
ZOOL 6—Genetics	2 or 4
BOTN 101—Plant Physiology	4
Technical Courses for Agronomy Students or	28
General Courses for Agronomy Students	12
(see explanation and lists below)	
Electives (Technical Crops curriculum) or	15
Electives (General Crops and Turf Management curricula)	31

Technical Crops Curriculum

Students must select 28 hours from the technical group. If the student desires to take more than 28 hours of technical courses they can be used as part of his 15 hours of electives or they can be substituted for other Department of Agronomy requirements with permission of the crops adviser.

General Crops and Turf Management Curricula

Students will select 12 hours from the General Courses listed below. Students in the turf management option must elect AGRO 109—Turf Management, HORT 20—Introduction to the Art of Landscaping, and HORT 107—Woody Plant Materials.

SOILS

University Requirements (see page 25)*College of Agriculture Requirements* (see page 25)

DEPARTMENTAL REQUIREMENTS (SOILS)

	<i>Semester Credit Hours</i>
AGRO 10—General Soils	4
AGRO 107—General Crop Production	3
AGRO 108—Forage Crop Production	3
AGRO 114—Soil Classification and Geography	4
AGRO 116—Soil Chemistry	3
AGRO 117—Soil Physics	3
AGRO—Additional Agronomy or Geology courses	6
AGRO 199—Senior Seminar	1
GEOLOG 1—Geology	3

GEOL 4—Physical Geology Laboratory	1
Technical courses for Agronomy students or	28
General courses for Agronomy students	12
(see explanation and lists below)	
Electives (Technical Curriculum) or	15
Electives (General Soils and Soil Conservation Curricula) ..	31

Technical Soils Curriculum

Students will select 28 hours from the technical group. If the student desires to take more than 28 semester hours of technical courses they can be used as part of his 15 hours of electives or they can be substituted for other Department of Agronomy requirements with permission of the soils adviser.

General Soils and Soil Conservation Curricula

Students will select 12 hours from the general course listed below. Students in soil conservation must elect AGRO 113—Soil Conservation, and BOTN 10—Principles of Conservation.

GEOLOGY

Students interested in geology can take sufficient courses under the Technical list to prepare for graduate work in geology at other institutions. The geology advisor will aid in the selection of proper electives for students who wish to prepare for graduate work in this area.

CROPS, SOILS, AND GEOLOGY

TECHNICAL COURSES WHICH MAY BE SELECTED BY CROPS, SOILS, AND GEOLOGY STUDIES.

	<i>Semester Credit Hours</i>
CHEM Additional Chemistry	8
MATH Additional Mathematics	12
PHYS General Physics	8

If the student elects more than 28 hours of technical courses they should be advanced courses in the above areas.

GENERAL COURSES WHICH MAY BE SELECTED BY THE CROPS AND SOILS STUDENTS.

	<i>Semester Credit Hours</i>
AGEN Agricultural Engineering	3
AGEC Agricultural Economics	3
ANSC Animal Science	3
HORT Horticulture	3

These courses may be replaced by courses from the technical group with permission of the adviser.

ANIMAL SCIENCE

The curriculum in animal science offers a broad background in general education, basic sciences, agricultural sciences and the opportunity for a student to emphasize that phase of animal agriculture in which he is specifically interested. Each student will be assigned to an adviser according to the program he plans to pursue.

Objectives

In addition to fulfilling the requirements of the University and the College of Agriculture, the following specific objectives have been established for the program in animal science:

1. To acquaint students with the role of animal agriculture in our cultural heritage.
1. To prepare students for careers in the field of animal agriculture. These include positions of management and technology associated with animal, dairy, or poultry production enterprises, positions with marketing and processing organizations, as well as in other allied fields such as feed, agricultural chemicals and equipment.
3. To prepare students for entrance to veterinary schools.
4. To prepare students for graduate study and subsequent careers in teaching, research and extension, both public and private.
5. To provide essential courses for the support of other academic programs of the University.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENTAL REQUIREMENTS

<i>Required Courses</i>	<i>Semester Credit Hours</i>
ANSC 1—Principles of Animal Science	3
FDSC 1—Introduction to Food Science	3
ANSC 109—Fundamentals of Nutrition	3
ANSC 116—Anatomy of Domestic Animals	3
ANSC 117—Introduction to Diseases of Animals	3
ZOOL 102 or 104—Vertebrate Physiology	4
Genetics	3
Agronomy	3
Agricultural Engineering	4
Insect Pests of Agriculture	4
Economics	3
Organic Chemistry	3

Physics	3
Math. and/or Biometrics	6
Electives	29

For students interested in a program of study with major emphasis on beef cattle, sheep, and swine, it is suggested that the elective courses include the following:

	<i>Semester Credit Hours</i>
ANSC 20—Fundamentals of Animal Production	3
ANSC 21—Seminar	1
ANSC 22—Livestock Evaluation	3
ANSC 110—Applied Animal Nutrition	3
ANSC 120—Advanced Livestock Judging	2
ANSC 121—Meat and Meat Products	3
ANSC 122, 123—Livestock Management	6
ANSC 130—Principles of Breeding	3

For students interested in a program of study with major emphasis on dairy-
ng, it is suggested that the elective courses include the following:

ANSC 40—Dairy Production	3
ANSC 41—Dairy Cattle Type Appraisal	1
ANSC 140—Physiology of Mammalian Reproduction	3
ANSC 141—Physiology of Milk Secretion	2
ANSC 142—Dairy Cattle Breeding	3

For students interested in a program of study with a major emphasis on
poultry, it is suggested that the elective courses include the following:

ANSC 61—Advanced Poultry Judging	1
ANSC 62—Commercial Poultry Mgt.	3
ANSC 160—Technology of Market Eggs and Poultry	3
ANSC 165—Physiology of Hatchability	1
ANSC 170—Poultry Hygiene	3
ANSC 171—Avian Anatomy	3
AGEC 117—Mkt. Eggs and Poultry	2

Students desiring a combination of training in one of the animal sciences
and emphasis on business, may choose elective courses from the following:

BSAD 10—Business Enterprise	3
BSAD 20—Principles of Acct.	3
BSAD 130—Business Statistics	3
BSAD 180—Business Law	3
BSAD 166—Business Communication	3
MATH 10—Introduction to Math	3
ECON 37—Fundamentals of Econ.	3
ECON 140—Money and Banking	3
BSAD 149—Marketing Principles and Organization	3
AGR 101—Introductory Agricultural Biometrics	3

BOTANY

The Department offers three major fields of work: plant morphology, cytology, cytogenetics and taxonomy; plant pathology; and plant physiology and ecology. The required courses for the freshman and sophomore years are the same for all students. In the junior and senior years, the student elects botany courses to suit his particular interest. Courses are required in other subjects to contribute toward a broad cultural education, and to support the courses selected in the chosen field of botany.

The curriculum as outlined, provides a complete survey of the field of botany for prospective high school teachers, and lays a good foundation for graduate work in botany in preparation for college teaching and for research in state or federal experiment stations, or in private research laboratories.

Students are also afforded an opportunity for training for other vocations involving various botanical applications, such as extension work, and positions with seed companies, canning companies and other commercial concerns.

Students who wish to meet the requirements for certificates in secondary education may elect basic courses in education. An additional semester will usually be necessary to take certain courses in education, including the required practice teaching. As long as the demand continues, a series of advanced courses will be offered in rotation in the summer session especially for teachers working toward the degree Master of Education in science teaching.

The Department of Botany has instituted an Honors Program which a student may enter if he desires and if he meets the requirements of the program.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENT OF BOTANY REQUIREMENTS

Semester Credit Hours

BOTN 2—General Botany	4
BOTN 11—Plant Taxonomy	3
BOTN 20—Diseases of Plants	4
BOTN 101—Plant Physiology	4
BOTN 102—Plant Ecology	2
BOTN 103—Plant Ecology Laboratory	1
BOTN 111—Plant Anatomy	3
BOTN 117—General Plant Genetics	2
BOTN 199—Seminar	2
Modern Language, preferably German	12
MATH 10, 11—Introduction to Mathematics	6
MICB 1—General Microbiology	4
ZOOL 1—General Zoology	4
PHYS 10, 11—Fundamentals of Physics	8
Botany electives or related courses	10
Electives	12

The major student, with the approval of his advisor, will elect additional courses in Botany and related subjects to provide the best possible basic training and preparation in the area of his special interest. Students contemplating graduate work are strongly advised to take Calculus, MATH 14, 15 and Organic Chemistry, CHEM 31, 33 as a part of their undergraduate program.

CONSERVATION AND RESOURCE DEVELOPMENT

The development and use of natural resources (including water, soil, minerals, fresh water and marine organisms, wildlife, air and human resources), are essential to the full growth of an economy.

The curriculum in Conservation and Resource Development is designed to instill concepts of the efficient development and judicious use of natural resources. The study of the problems associated with the use of natural resources will acquaint students with their role in economic development, cultural heritage, and their necessary consideration in future expansion.

Students will prepare for professional and administrative positions in land and water conservation projects, for careers in operational, administrative, educational and research work in land use, rural area development, water resources, recreational area development and management, or for graduate study in any of several areas within the biological sciences.

Students will pursue a broad education program and then elect subjects concentrated in a specific area of interest. A student will be assigned an adviser according to his area of interest.

Students will be encouraged to obtain summer positions which will give them technical laboratory or field experience in their chosen interest area.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

CONSERVATION AND RESOURCE DEVELOPMENT REQUIREMENTS	Semester Credit Hours
AGRI 100—Introductory Agricultural Biometrics	3
AGEN 1—Introduction to Agricultural Engineering	4
AGRO 10—General Soils	4
BOTN 2—General Botany	4
BOTN 10—Principles of Conservation	3
BOTN 11—Plant Taxonomy (or BOTN 153)	3(2)
BOTN 102—Plant Ecology	2
BOTN 103—Plant Ecology Laboratory	1
ENTM 15—Introductory Entomology	3
GEOG 10—General Geography	3
GEOL 1—Geology	3
MATH 10, 11—Introduction to Mathematics (or MATH 18, 19)	3, 3
MICB 1—General Microbiology	4
ZOOL 2—Animal Phyla	4
ZOOL 121—Animal Ecology	3
Electives	27

ENTOMOLOGY

This curriculum prepares students for work in various types of entomological positions. Professional entomologists are engaged in fundamental and applied research, regulatory and control services with state and federal agencies,

commercial pest control, sales and developmental programs with chemical companies and other commercial organizations, consulting work, extension work, and teaching.

Most of the first two years of this curriculum is devoted to obtaining the essential background. In the junior and senior year there is opportunity for some specializing. Students contemplating graduate work are strongly advised to elect courses in physics, modern language, and biometrics.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

	Semester Credit Hours
DEPARTMENT OF ENTOMOLOGY REQUIREMENTS	
ENTM 15—Introductory Entomology	3
ENTM 20—Insect Pests of Agricultural Crops	4
ENTM 105—Medical Entomology	3
ENTM 120—Insect Taxonomy and Biology	4
ENTM 122—Insect Morphology	4
ENTM 123—Insect Physiology	4
ENTM 198—Special Problems	2
ENTM 199—Seminar	2
BOTN 11—Plant Taxonomy	3
BOTN 20—Diseases of Plants	4
CHEM 31-33—Elements of Organic Chemistry	6
MATH 10, 11—Introduction to Mathematics	6
MICB 1—General Microbiology	4
ZOOL 2—The Animal Phyla or ZOOL 118— Invertebrate Zoology	4
ZOOL 6—Genetics	4
Electives	19

FOOD SCIENCE

Food Science applies the fundamentals of the physical and biological sciences to the problems of procurement, preservation, processing, packaging, and marketing foods in a manner that would satisfy man's needs both nutritionally and aesthetically.

Opportunities for careers in food science exist in areas of meats, milk and milk products, fruits and vegetables, poultry and eggs, sea food, baby foods, confections, pet foods, cereals, flavors and colors, etc. Specific positions in Industry, Universities, and Government, include product development, production, engineering, research, quality control, technical service, technical sales, and teaching.

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

(Both BOTN 1 and ZOOL 1 required)

	Semester Credit Hours
CURRICULUM REQUIREMENTS	
Production course ²	3
MICB 1—General Microbiology	4
MICB 81—Applied Microbiology	4

² ANSC 1, AGRO 1, HORT 5, HORT 58, or AGEN 1.

PHYS 10—Fundamentals of Physics	4
ANSC 109—Fundamentals of Nutrition	3
CHEM 31, 33—Elements of Organic Chem.	3, 3
FOOD 153—Experimental Food Science	3
AGEN 113—Mechanics of Food Processing	4
FDSC 1—Introduction to Food Science	3
FDSC 102, 103—Principles of Food Processing—I, II	3, 3
FDSC 111—Food Chemistry	3
FDSC 112—Analytical Quality Control	3
FDSC 113—Statistical Quality Control	3
FDSC 131—Food Product Research and Development	3
FDSC 199—Seminar	1
Electives	21

HORTICULTURE

The Department of Horticulture offers instruction in pomology (fruits), olericulture (vegetables), floriculture (flowers), and ornamental horticulture, and processing of horticultural crops. These courses prepare students to enter commercial production and the horticultural industries such as fruit and vegetable processing, seed production and retail florists and nurseries. Students are likewise prepared to enter the allied industries as horticultural workers with fertilizer companies, equipment manufacturers, and others. Students who wish to enter specialized fields of research and teaching may take advanced work in the Department.

The new curriculum, Horticultural Education, is designed for persons who wish to prepare for teaching horticulture in the secondary schools. It provides basic training in horticulture and includes the necessary courses for teacher certification.

The Department of Horticulture is a cooperating department in the new curriculum Food Science.

POMOLOGY AND OLERICULTURE CURRICULUM

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENT OF HORTICULTURE REQUIREMENTS

*Semester
Credit Hours*

HORT 5, 6—Tree Fruit Production	3, 2
HORT 58—Vegetable Production	3
HORT 59—Berry Production	3
HORT 62—Plant Propagation	3
HORT 101—Technology of Fruits	3
HORT 103—Technology of Vegetables	3
HORT 161—Physiology of Maturation and Storage of Horticultural Crops	2
HORT 199—Seminar	1
BOTN 20—Diseases of Plants	4
BOTN 101—Plant Physiology	4
BOTN 117—General Plant Genetics	2
AGRO 10—General Soils	4

ENTM 20—Insect Pests of Agricultural Crops	4
A minimum of 3 additional Horticultural credits	3
Electives	30

FLORICULTURE AND ORNAMENTAL HORTICULTURE CURRICULUM

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENT OF HORTICULTURE REQUIREMENTS

	<i>Semester Credit Hours</i>
HORT 11—Greenhouse Management	3
HORT 12—Greenhouse Management Laboratory	1
HORT 16—Garden Management	2
HORT 17—Flower Production Laboratory	1
HORT 20—Introduction to the Art of Landscaping	3
HORT 56—Basic Landscape Composition	2
HORT 62—Plant Propagation	3
HORT 100—Principles of Landscape Design	3
HORT 105—Technology of Ornamentals	3
HORT 107, 108—Woody Plant Materials	3, 3
HORT 162—Fundamentals of Greenhouse Crop Production ..	3
HORT 199—Seminar	1
BOTN 11—Plant Taxonomy	3
BOTN 20—Diseases of Plants	4
BOTN 101—Plant Physiology	4
BOTN 117—General Plant Genetics	2
AGRO 10—General Soils	4
ENTM 116—Insect Pests of Ornamentals and Greenhouse Plants	3
Electives	23

HORTICULTURAL EDUCATION CURRICULUM

University Requirements (see page 25)

College of Agriculture Requirements (see page 25)

DEPARTMENT OF HORTICULTURE REQUIREMENTS

HORT 11—Greenhouse Management	3
HORT 12—Greenhouse Management Laboratory	1
HORT 16—Garden Management	2
HORT 17—Flower Production Laboratory	1
HORT 20—Introduction to the Art of Landscaping	3
HORT 56—Basic Landscape Composition	2
HORT 62—Plant Propagation	3
HORT 100—Principles of Landscape Design	3
HORT 105—Technology of Ornamentals	3
HORT 199—Seminar	1
BOTN 11—Plant Taxonomy	3
BOTN 20—Diseases of Plants	4
BOTN 101—Plant Physiology	4
AGRO 10—General Soils	4
ENTM 116—Insect Pests of Ornamentals and Greenhouse Plants	3
EDUC 111—Foundations of Education	3
RLED 109—Teaching Secondary Agriculture	3
RLED 101—Teaching Materials and Demonstrations	2
RLED 103—Student Teaching	5

DEPARTMENT OF HORTICULTURE REQUIREMENTS (<i>Continued</i>)	<i>Semester Credit Hours</i>
RLED 104—Student Teaching	1-4
RLED 107—Introduction to Agricultural Education	2
RLED 111—Teaching Young and Adult Farmer Groups	1
Elect one of the following courses:	
PSYC 110—Educational Psychology (3)	
EDUC 110—Human Development and Learning (6)	
A minimum of 12 additional Agricultural credits	12
Approved Electives	0-6
Total	124

SPECIAL CURRICULA

PRE-FORESTRY STUDENTS

The College of Agriculture is glad to cooperate with any student who wishes to attend the University to pursue courses which may be transferred to a standard forestry curriculum in another institution. The program which a student follows depends to some extent upon the forestry college he plans to enter. All pre-forestry students in the College of Agriculture are sent to the Department of Botany of the University for counsel and advice in these matters.

For residents of Maryland who have completed two years of pre-forestry and have satisfied requirements comparable to those at the University of Maryland and have been accepted in the School of Forestry at North Carolina State University, the University of Maryland will pay the non-resident fee for a period of two years.

THE PRE-FORESTRY CURRICULUM INCLUDES:	<i>Semester Credit Hours</i>
ENGL 1, 3, 4	9
BOTN 1	4
ZOOL 1	4
MATH 10, 11, 14, 15	12
CHEM 1, 3	8
PHYS 10, 11	8
SPCH 7	2
BOTN 11	3
HORT 30	3
AGRI 1	1
Social Science	9
HLTH 5	2

Students planning for 3 years in the Pre-Forestry curriculum should include BOTN 20, ENTM 15, AGRO 1, AGEN 1, AGRO 10, and BOTN 10.

PRE-THEOLOGICAL STUDENTS

The College of Agriculture is glad to cooperate with the officers of any theological seminary who desire to urge its prospective students to pursue courses in agriculture as a preparation for the rural ministry. Such pre-theological students may enroll for a semester or more or for the usual four year training of the College. In either case they should enroll as members of the general curriculum in the College of Agriculture. Students desiring to pursue a pre-theological program in the College of Agriculture of the University of Maryland, should consult with the president or admissions officer of the theological seminary which they expect to attend.

PRE-VETERINARY STUDENTS

This program is designed for students desiring to prepare for the professional course in veterinary medicine.

A combined degree is available to students in pre-veterinary science. A student who has completed 90 academic semester credits at the University of Maryland and who has completed 30 additional academic semester credits at the University of Georgia or at any accredited veterinary school is eligible to make application for the Bachelor of Science degree from the University of Maryland.

Students wishing to apply for the combined degree must fulfill University and College requirements as set forth on page 25 and must also complete additional credits in Animal Science.

The State of Maryland has entered a regional agreement with the State of Georgia which makes ten spaces a year available in the School of Veterinary Medicine, University of Georgia. The spaces are to be filled on a competitive basis from among qualified applicants.

Candidates, to be considered qualified, must have:

- a. Completed the curriculum shown below with grades not less than "C" in any subject.
- b. Taken the veterinary medical aptitude test; and
- c. Must be a bona fide resident of Maryland.

All requirements must be completed by June prior to the September in which the student desires to matriculate in veterinary college. The pre-veterinary curriculum can be completed in two years but may be extended, thus making it possible for the applicant to select desirable electives.

After the names of the candidates have been received, a Georgia Board of Admissions will assemble at the University of Maryland and will interview each candidate and receive the transcript and all pertinent documents relating to him. The selection will be made by the Office of Admissions, University of Georgia.

The pre-veterinary curriculum should contain:

	<i>Semester Credit Hours</i>
Biological Sciences	12
Botany (4)	
Zoology (8)	
English and Speech	12
Physical Sciences	30
Inorganic Chemistry (8)	
Organic Chemistry (8)	
Mathematics (6)	
Physics (8)	
Animal Science	9
Genetics	3
Nutrition	3
Social Science ^a	3
History	6
Physical Education	2
Health	2
Air Science Optional .....	..

^a This credit may be satisfied by examination at the University of Georgia.

U. S. Department of Agriculture and the survey sampling methods used by that agency for computing the Department's official statistics on crops, livestock and livestock products, production, agricultural prices and farm employment. Emphasis is on statistical procedures used for preparing approximately 350 reports issued annually by the Crop Reporting Board of the U. S. Statistical Reporting Service. (Designed especially for foreign students in FAO and AID-Program of Technical Cooperation but very beneficial to any student interested in the area.) (Bookhout.)

AGEC 103. INTRODUCTION TO AGRICULTURAL BUSINESS. (3)

Second Semester. The relationships between the organization of agricultural business and political and economic systems are investigated. The course includes description and analyses of the historical development of agricultural businesses, structural relationships, legal aspects, financial requirements, and the division of responsibility between boards and management. Measurements of performance and indicators of business success are studied. Future developments in agricultural business structure are examined. (Smith.)

AGEC 104. ECONOMICS OF AGRICULTURAL TRANSPORTATION. (3)

First semester. The course deals with the unique nature of agriculture in broad perspective as it relates to economics of transportation of the products involved. It includes the development of agricultural transportation, effect of legislation and regulation upon this development, and growth of the intercarrier competition. Theories of rate making and classification of carriers are discussed from the standpoint of the effect of transportation costs and methods upon plant and industry location in agriculture. (Smith.)

AGEC 106. PRICES OF AGRICULTURAL PRODUCTS. (3)

Second semester. An introduction to agricultural price behavior. Emphasis is placed on the use of price information in the decision-making process, the relation of supply and demand in determining agricultural prices, and the relation of prices to grade, time, location, and stages of processing in the marketing system. The course includes elementary methods of price analysis, the concept of parity, and the role of price support programs in agricultural decisions. (Suttor.)

AGEC 107. FINANCIAL ANALYSIS OF THE FARM BUSINESS. (3)

First semester. Application of economic principles to develop criteria for a sound farm business, including credit source and use, preparing and filing income tax returns, methods of appraising farm properties, the summary and analysis of farm records, leading to effective control and profitable operation of the farm business. (Wysong.)

AGEC 108. FARM MANAGEMENT. (3)

Second semester. The organization and operation of the farm business to obtain an income consistent with family resources and objectives. Principles of production economics and other related fields are applied to the individual farm business. Laboratory period will be largely devoted to field trips and other practical exercises. (Lessley.)

AGEC 109. INTRODUCTION TO ECONOMETRICS IN AGRICULTURE. (3)

First semester. An introduction to the application of econometric techniques to agricultural problems with emphasis on the assumptions and computational techniques necessary to derive statistical estimates, test hypotheses, and make

predictions with the use of single equation models. Includes linear and non-linear regression models, internal least squares, discriminant analysis and factor analysis. (Suttor.)

AGEC 111. ECONOMICS OF RESOURCE DEVELOPMENT. (3)

First semester. Economic, political, and institutional factors which influence the use of land resources. Application of elementary economic principles in understanding social conduct concerning the development and use of natural and man-made resources. (Tuthill.)

AGEC 112. AGRICULTURAL POLICY AND PROGRAMS. (3)

First semester. A study of public policies and programs related to the problems of agriculture. Description, analysis and appraisal of current policies and programs will be emphasized. (Beal.)

AGEC 114. WORLD AGRICULTURAL PRODUCTION AND TRADE. (3)

First semester. World production, consumption, and trade patterns for agricultural products. International trade theory applied to agricultural products. National influences on international agricultural trade. (Foster.)

AGEC 115. MARKETING ANIMALS AND ANIMAL PRODUCTS. (3)

First semester. Principles, functions, methods and channels of marketing animals and animal products including livestock and livestock products, dairy animals and dairy products, and poultry and poultry products. Application of basic principles of economics and marketing in a study of the role of the marketing system and development of measures of performance. (Smith.)

AGEC 116. MARKETING PLANT PRODUCTS. (3)

Second semester. Principles, functions, methods and channels of marketing plant products including fruits, vegetables, horticultural specialties, grain and tobacco. Analyses of supply, demand, prices, grading, regulatory activities, and government programs and services. (Cain.)

AGEC 119. FOREIGN AGRICULTURAL ECONOMICS. (3)

Second semester. Analysis of the agricultural economy of selected areas of the world. The interrelationships among institutions and values, such as government and religion, and the economics of agricultural organization and production. (Evans.)

AGEC 195. HONORS READING COURSE IN AGRICULTURAL ECONOMICS I. (3)

First semester. Selected readings in political and economic theory from 1700 to 1850. This course develops a basic understanding of the development of economic and political thought as a foundation for understanding our present society and its cultural heritage. Prerequisite: Acceptance in the Honors Program of the Department of Agricultural Economics. (Bender.)

AGEC 196. HONORS READING COURSE IN AGRICULTURAL ECONOMICS II. (3)

Second Semester. Selected readings in political and economic theory from 1850 to the present. This course continues the development of a basic understanding of economic and political thought begun in AGEC 195. This understanding on the part of the student is further developed and broadened in this semester by the examination of modern problems in agricultural economics in the light of the material read and discussed in AGEC 195 and AGEC 196. Prerequisite: Successful completion of AGEC 195 and registration in the Honors Program of the Department of Agricultural Economics. (Via.)

AGEC 198. SPECIAL PROBLEMS. (1-2) (2 cr. max.) (Not for grad. cr.)

First and second semesters and summer. Concentrated reading and study in some phase or problem in agricultural economics. (Staff.)

AGEC 199. SEMINAR. (1, 1)

First and second semesters. Students will obtain experience in the selection, preparation and presentation of economic topics and problems which will be subjected to critical analysis. (Ishee.)

For Graduates

AGEC 200. APPLICATION OF ECONOMETRICS IN AGRICULTURE. (3)

First semester. Tools for analyzing demand and price behavior of agricultural products. Theories of least squares, estimation of structural economic relations in simultaneous equation systems, identification problems, and non-linear estimation techniques. (Bender.)

AGEC 201. ADVANCED THEORY AND PRACTICE OF INTERNATIONAL AGRICULTURAL TRADE. (3)

Second semester. Advanced theory, policies and practice in international trade in agricultural products. Includes principal theories of trade and finance, agricultural trade policies of various countries, and the mechanics of how trade is conducted. (Moore.)

AGEC 202. MARKET STRUCTURE IN AGRICULTURE. (3)

First semester. This course centers on the concept of market structure analysis, with application of principles developed to agricultural industries. The dimension of market structure is analyzed along with its impact on conduct and performance. Considerable time is spent on policy issues and the application of the antitrust laws to agricultural industries. (Moore.)

AGEC 208. AGRICULTURAL PRICE AND INCOME POLICY. (3)

Second semester. The evolution of agricultural policy in the United States, emphasizing the origin and development of governmental programs, and their effects upon agricultural production, prices and income. (Beal.)

AGEC 210. ADVANCED AGRICULTURAL PRICE AND DEMAND ANALYSIS. (3)

An advanced study in the application of demand theory to the behavior of prices of agricultural products. Includes a detailed examination of price, cross-price and income elasticities of demand as well as elasticity of substitution. The role of demand analyses in the study of general economic problems, including market equilibrium, excessive, and insufficient aggregate demand of agricultural products is appraised and discussed. (Suttor.)

AGEC 212. AGRICULTURE IN WORLD ECONOMIC DEVELOPMENT. (3)

First semester. Theories and concepts of what makes economic development happen. Approaches and programs for stimulating the transformation from a primitive agricultural economy to an economy of rapidly developing commercial agriculture and industry. Analysis of selected agricultural development programs in Asia, Africa and Latin America. (Foster.)

AGEC 214. ADVANCED AGRICULTURAL MARKETING. (3)

Second semester. Advanced study of the complex theoretical, institutional and legal factors governing both domestic and foreign agricultural trade, with particular attention given to policies and practices affecting cost and price.

(Beal.)

AGEC 216. ECONOMICS OF AGRICULTURAL PRODUCTION. (3)

First semester. Study of the more complex problems involved in the long-range adjustments, organization and operation of farm resources, including the impact of new technology and methods. Applications of the theory of the firm, linear programming, activity analysis, and input-output analysis.

(Ishee.)

AGEC 218. AGRICULTURAL ECONOMICS RESEARCH TECHNIQUES. (3)

First semester. Emphasis is given to philosophy and basic objectives of research in the field of agricultural economics. The course is designed to help students define a research problem and work out logical procedures for executing research in the social sciences. Attention is given to the techniques and tools available to agricultural economists. Research documents in the field will be appraised from the standpoint of procedures and evaluation of the research.

(Cain.)

AGEC 219. ADVANCED LAND ECONOMICS. (3)

Second semester. Application of micro and macro economic principles to the analyses of special problems related to land such as public direction of land use, tenure arrangements, conservation, and land reform movements.

(Wysong.)

AGEC 220. INTERNATIONAL IMPACTS OF SELECTED AGRICULTURAL FORCES. (3)

Second semester. Selected agricultural forces (such as pressure of population on food supply) and their impacts on the political, social, and economic development of the world.

(Foster.)

AGEC 300. SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (3)

First and second semester. This course is designed to offer students special subject matter in the field of Agricultural Economics. Subject matter taught in this course will be varied and will depend on the persons available for teaching unique and specialized phases of Agricultural Economics. The course will be taught by the staff or visiting Agricultural Economists who may be secured on lectureship or visiting professor basis.

(Staff.)

AGEC 301. SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (1-2) (4 cr. max.)

First and second semesters and summer: Intensive study and analysis of specific problems in the field of agricultural economics, which will provide information in depth in areas of special interest to the student.

(Staff.)

AGEC 302. SEMINAR. (1, 1)

First and second semesters: Students will participate through study of problems in the field, reporting to seminar members and defending positions adopted. Outstanding leaders in the field will present ideas for analyses and discussion among class members. Students involved in original research will present progress reports. Class discussion will provide opportunity for constructive criticism and guidance.

(Curtis.)

AGEC 399. RESEARCH. (6 hrs. M.S., additional 6 hrs. Ph.D.)

First, second semesters and summer: Advanced research in agricultural economics. Credit according to work accomplished.

(Staff.)

AGRICULTURAL AND EXTENSION EDUCATION

Professors: CARDOZIER, KREBS AND RYDEN.

Associate Professors: LONGEST AND SMITH.

Research Associate: FORSYTHE.

For Advanced Undergraduates

RLED 101. TEACHING MATERIALS AND DEMONSTRATIONS. (2)

First semester. Principles and practices of the demonstration method; construction and use of visual aids in teaching agriculture.

RLED 103. STUDENT TEACHING. (5)

First semester. Prerequisite, satisfactory academic average and permission of instructor. Fulltime student teaching in an off-campus student teaching center under an approved supervising teacher of agriculture. Participating experience in all aspects of the work of a teacher of agriculture. (Krebs.)

RLED 104. STUDENT TEACHING. (1-4)

First semester. Prerequisite, satisfactory academic average and permission of instructor. Fulltime observation and participation in work of teacher of agriculture in off-campus student teaching center. Provides students opportunity to gain experience in the summer program of work, to participate in opening of school activities, and to gain other experience needed by teachers. (Cardozier.)

RLED 107. INTRODUCTION TO AGRICULTURAL EDUCATION. (2)

An overview of the job of the teacher of agriculture; examination of agricultural education programs for youth and adults. (Cardozier.)

RLED 109. TEACHING SECONDARY VOCATIONAL AGRICULTURE. (3)

First semester. A comprehensive course in the work of high school departments of vocational agriculture. It emphasizes particularly placement, supervised farming programs, the organization and administration of Future Farmer activities, and objectives and methods in all-day instruction. (Krebs.)

RLED 111. TEACHING YOUNG AND ADULT FARMER GROUPS. (1)

First semester. Characteristics of young and adult farmer instruction in agriculture. Determining needs for and organizing a course; selecting materials for instruction; and class management. Emphasis is on the conference method of teaching. (Smith.)

RLED 121. DIRECTED EXPERIENCE IN EXTENSION EDUCATION. (1-5)

Prerequisite, satisfactory academic average and permission of instructor. Fulltime observation and participation in selected aspects of extension education in an approved training county. (Ryden.)

RLED 161. 4-H ORGANIZATION AND PROCEDURE. (2)

A study of the youth phase of cooperative extension work. Emphasis is placed on the philosophy, objectives, organization, leadership development and methods used in conducting 4-H Club work at the local and county level. (Ryden.)

RLED 198. SPECIAL PROBLEMS. (1-3)

Prerequisite, approval of staff.

(Staff.)

RLED 199. SEMINAR IN AGRICULTURAL EDUCATION. (1)

Examination of current literature, reports and discussions of problems, trends, and issues in agricultural education. (Staff.)

For Advanced Undergraduates and Graduates

RLED 114. RURAL LIFE IN MODERN SOCIETY. (3)

Examination of the many aspects of rural life that effect and are affected by, changes in technical, natural and human resources. Emphasis is placed on the role which diverse organizations, agencies, and institutions play in the education and adjustment of rural people to the demands of modern society. (Longest.)

RLED 150. EXTENSION EDUCATION. (2)

Second semester. The Agricultural Extension Service as an educational agency. The history, philosophy, objectives, policy, organization, legislation and methods used in extension work. (Ryden.)

RLED 160. EXTENSION COMMUNICATIONS. (2)

First semester. An introduction to communications in teaching and within an organization, including barriers to communication, the diffusion process and the application of communication principles person to person, with groups and through mass media. (Ryden.)

RLED 170, 171. CONSERVATION OF NATURAL RESOURCES. (3, 3)

Laboratory fee, \$35.00. Designed primarily for teachers. Study of state's natural resources—soil, water, fisheries, wildlife, forests, and minerals—natural resources problems and practices. Extensive field study. First course concentrates on subject matter; second includes methods of teaching conservation. Courses taken concurrently in summer season.

RLED 180, 181. CRITIQUE IN RURAL EDUCATION. (1, 1)

Summer session only. Current problems and trends in rural education.

RLED 185. DEVELOPMENT AND MANAGEMENT OF EXTENSION YOUTH PROGRAMS. (3)

Designed for present and prospective state leaders of extension youth programs. Program development, principles of program management, leadership development and counseling; science, career selection and citizenship in youth programs, field experience in working with low income families' youth, urban work. (Ryden.)

For Graduates

RLED 200. RESEARCH METHODS IN RURAL EDUCATION. (2-3)

First semester. The scientific method, problem identification, survey of research literature, preparing research plans, design of studies, experimentation, analysis of data, and thesis writing. (Cardozier.)

RLED 201. RURAL COMMUNITY ANALYSIS. (3)

Analysis of structure and function of rural society and application of social understandings to educational processes. (Smith.)

RLED 204. DEVELOPING RURAL LEADERSHIP. (2-3)

Theories of leadership are emphasized. Techniques of identifying formal and informal leaders and the development of rural lay leaders. (Longest.)

RLED 207, 208. SPECIAL TOPICS IN RURAL EDUCATION. (2, 2)

Prerequisite, permission of instructor.

(Staff.)

RLED 209. RURAL ADULT EDUCATION. (2)

Second semester. Principles of adult education applied to rural groups. Understanding adult motivation, ability and behavior. Effective methods of planning, organizing and conducting rural adult educational programs.

(Ryden.)

RLED 215. SUPERVISION OF STUDENT TEACHING. (1)

Summer session. Identification of experiences and activities in an effective student teaching program, responsibilities and duties of supervising teachers, and evaluation of student teaching.

(Cardozier.)

RLED 217. PROGRAM PLANNING AND EVALUATION IN AGRICULTURAL EDUCATION. (2-3)

Second semester. Analysis of community agricultural education needs, selection and organization of course content, and criteria and procedures for evaluating programs.

(Krebs.)

RLED 225. PROGRAM DEVELOPMENT IN EXTENSION EDUCATION. (2)

Second semester. Prerequisite, R. Ed. 150 or equivalent. Principles and procedures of program planning and development in extension education.

(Ryden.)

RLED 240. AGRICULTURAL COLLEGE INSTRUCTION. (1)

(Cardozier.)

RLED 301. SPECIAL PROBLEMS. (1-3)

Prerequisite, approval of staff.

(Staff.)

RLED 302. SEMINAR IN RURAL EDUCATION. (1, 1)

First and second semesters. Problems in the organization, administration, and supervision of the several agencies of rural education. Investigations, papers, and reports.

(Staff.)

RLED 399. RESEARCH. (1-6)

(Staff.)

AGRICULTURAL ENGINEERING

Professors: GREEN AND BURKHARDT.

Associate Professors: FELTON, GIENGER, HARRIS, MATTHEWS, SCHWIESOW AND WINN.

Instructors: BRODIE AND STEWART.

AGEN 1. INTRODUCTION TO AGRICULTURAL ENGINEERING. (4)

First and second semesters. Three lectures and one laboratory per week. Applications of mathematics, physics, and engineering techniques in the solution of agricultural engineering problems. Studies will include farm power and machinery, farm structures and electrification and soil and water conservation.

(Matthews.)

AGEN 56. INTRODUCTION TO FARM MECHANICS. (2)

First and second semesters. One lecture and one laboratory period a week. A study of the hand tools and power equipment and their safe use as it applies to mechanized farms. Principles and practice in arc and gas welding, cold metal and sheet metal work are provided. Also, tool fitting, woodworking, plumbing, blue print reading and use of concrete. (Gienger.)

AGEN 86. AGRICULTURAL ENGINEERING SHOP TECHNIQUES. (1)

Second semester. One laboratory per week. Agricultural Engineering majors only. Shop techniques and procedures used in construction of experimental agricultural machinery and equipment. Operation principles of power and hand tools. A term problem to develop plans and techniques for construction, to select materials and to construct an assigned unit will be required. (Burkhardt.)

For Advanced Undergraduates and Graduates

AGEN 104. FARM MECHANICS. (2)

First semester. Two laboratory periods a week. Available only to seniors in agricultural education. This course consists of laboratory exercises in practical farm shop and farm equipment maintenance, repair, and construction projects, and a study of the principles of shop organization and administration. (Gienger.)

AGEN 113. MECHANICS OF FOOD PROCESSING. (4)

First semester. Three lectures and one laboratory. Prerequisite. PHYS 1 or 10. Applications in the processing and preservation of foods of power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis. (Matthews.)

AGEN 123. AGRICULTURAL PRODUCTION EQUIPMENT. (3)

First semester. Two lectures and one laboratory per week. Prerequisite. AGEN 1. Principles of operation and functions of power and machinery units as related to tillage; metering devices; cutting, conveying and separating units; and control mechanisms. Principles of internal combustion engines and power unit components. (Matthews.)

AGEN 124. AGRICULTURAL MATERIALS HANDLING AND ENVIRONMENTAL CONTROL. (3)

Second semester. Two lectures and one laboratory per week. Prerequisite. AGEN 1. Characteristics of construction materials and details of agricultural structures. Fundamentals of electricity, electrical circuits, and electrical controls. Materials handling and environmental requirements of farm products and animals. (Matthews.)

AGEN 143. AGRICULTURAL POWER AND MACHINERY ANALYSIS. (4)

First semester. Three lectures and one laboratory per week. Prerequisites. AGEN 1, ENES 21 and ENME 1. Analysis of power units and equipment used for agricultural production with emphasis on functional design requirements. Fundamentals of power transmission, principles of internal combustion engines and force analysis. (Harris.)

AGEN 144. DESIGN OF OPERATIONAL SYSTEMS FOR AGRICULTURE. (3)

Second semester. Two lectures and one laboratory per week. Prerequisite. MATH 21 and PHYS 32. Principles and engineering requirements of agricultural environmental control. Included are studies of controlling heat and moisture produced by animals and crops, static loading of farm structures and electrical components as related to environment and materials handling. (Harris.)

AGEN 145. SOIL AND WATER CONSERVATION ENGINEERING. (2)

Second semester. Two lectures per week. Prerequisites, ENCE 90 and ENME 102. Applications of engineering and soil sciences in erosion control, drainage, irrigation and watershed management. Principles of agricultural hydrology and design of water control and conveyance systems. (Schweisow.)

AGEN 165. GENERAL HYDROLOGY. (3)

Second semester. Three lectures per week. Qualitative aspects of basic hydrologic principles pertaining to the properties, distribution and circulation of water as related to public interest in water resources. (Schweisow.)

AGEN 175. ENGINEERING HYDROLOGY. (3)

First semester. Three lectures per week. Prerequisites, MATH 66, ENCE 105 or ENME 102. Properties, distribution and circulation of water from the sea and in the atmosphere emphasizing movement overland, in channels and through the soil profile. Qualitative and quantitative factors are considered. (Schweisow.)

AGEN 189. SENIOR PROBLEM. (2)

Prerequisite, approval of Department. Students will select individual projects, prepare design, conduct, experiment or analyze experimental data and present both an oral and written report to Departmental faculty. (Staff.)

AGEN 198. SPECIAL PROBLEMS IN FARM MECHANICS. (1-3)

First and second semesters. Prerequisite, approval of Department. Not acceptable for majors in agricultural engineering. Problems assigned in proportion to credit. (Gienger.)

For Graduates
AGEN 201. SPECIAL TOPICS IN AGRICULTURAL ENGINEERING. (3)

First and second semesters. Two lectures and one laboratory period per week. Timely topics in specialized areas of agricultural engineering will be selected as needed by graduate students; for example, Instrumentation for Agricultural Engineering Research. (Staff.)

AGEN 301. SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. (1-6)

First and second semesters. Summer session. Work assigned in proportion to amount of credit. (Staff.)

AGEN 302. SEMINAR. (1, 1)

First and second semesters. Prerequisite, permission of instructor. (Harris.)

AGEN 399. RESEARCH. (1-6)

Credit according to work accomplished. (Staff.)

AGRONOMY—CROPS, SOILS, AND GEOLOGY

Professors: J. MILLER, AXLEY, DECKER, ROTHGEB, STREET AND STRICKLING.

Associate Professors: CLARK.

Assistant Professors: BEZDICEK, DEAL, FANNING, FERNOW, FOSS, F. MILLER, NEWCOMER, PAROCHETTI, SCHILLINGER, SIEGRIST AND STIFEL.

CROPS

AGRO 1. CROP PRODUCTION. (3)

Second semester. Two lectures and one laboratory period a week. Culture, use, improvement, adaptation, distribution, and history of field crops. (Clark.)

For Advanced Undergraduates and Graduates

AGRO 103. CROP BREEDING. (2)

First semester, alternate years. (Offered 1968-69.) Prerequisite, BOTN 117 or ZOOL 6. Principles and methods of breeding annual self and cross-pollinated plants and perennial forage species. (Schillinger.)

AGRO 104. TOBACCO PRODUCTION. (3)

Second semester. Three lectures a week. Prerequisite, BOTN 1. A study of the history, adaptation, distribution, culture, and improvement of various types of tobacco, with special emphasis on problems in Maryland tobacco production. Physical and chemical factors associated with yield and quality of tobacco will be stressed. (Street.)

AGRO 107. CEREAL CROP PRODUCTION. (3)

First semester, alternate years. (Offered 1968-69.) Two lectures and one laboratory period a week. Prerequisite, BOTN 1. Study of the principles and practices of corn, wheat, oats, barley, rye, and soybean production. (Rothgeb.)

AGRO 108. FORAGE CROP PRODUCTION. (3)

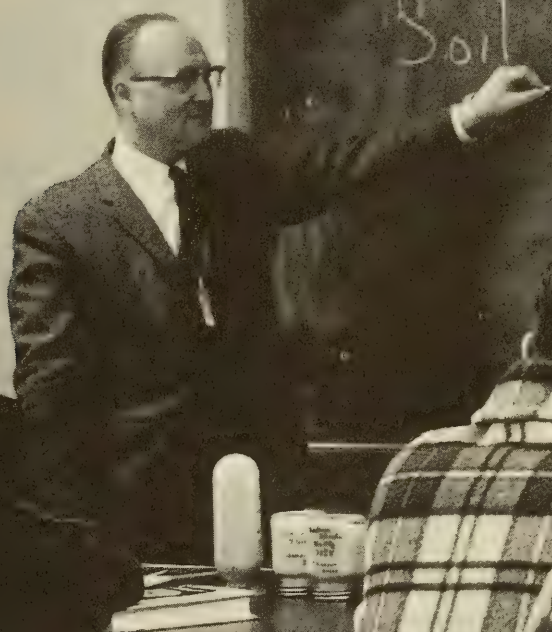
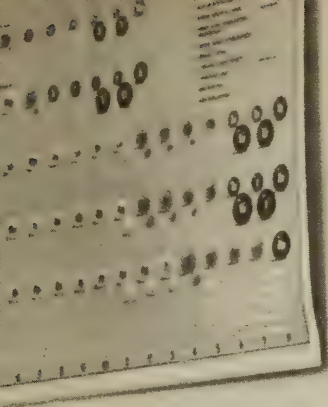
Second semester. Two lectures and one laboratory period a week. Prerequisite, BOTN 1. Study of the production and management of grasses and legumes for quality hay, silage, and pasture. (Decker.)

AGRO 109. TURF MANAGEMENT. (3)

First semester, alternate years. (Offered 1969-70). Two lectures and one laboratory period per week. Prerequisite, BOTN 1. A study of principles and practices of managing turf for lawns, golf courses, athletic fields, playgrounds, airfields and highways for commercial sod production. (Deal.)

AGRO 151. CROPPING SYSTEMS. (2)

First semester. Two lectures a week. Prerequisite, AGRO 1 or equivalent. The coordination of information from various courses in the development of balanced cropping systems, appropriate to different objectives in various areas of the state and nation. (Clark.)



Soil Chemistry

K^+ H^+ Mg^{++}

AGRO 152. SEED PRODUCTION AND DISTRIBUTION. (2)

Second semester, alternate years. (Offered 1968-69.) One lecture and one laboratory period a week. Prerequisite, AGRO 1 or equivalent. A study of seed production, processing, and distribution; federal and state seed control programs; seed laboratory analysis; release of new varieties; and maintenance of foundation seed stocks. (Newcomer.)

AGRO 154. WEED CONTROL. (3)

First semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory period a week. Prerequisite, AGRO 1 or equivalent. A study of the use of cultural practices and chemical herbicides in the control of weeds. (Parochetti.)

For Graduates

AGRO 201. ADVANCED CROP BREEDING. (2)

First semester, alternate years. (Offered 1969-70.) Two lectures a week. Prerequisite, AGRO 103 or equivalent. Genetic, cytogenetic, and statistical theories underlying methods of plant breeding. A study of quantitative inheritance, herterosis, heritability, interspecific and intergeneric hybridization, polyploidy, sterility mechanisms, inbreeding and outbreeding, and other topics as related to plant breeding. (Schillinger.)

AGRO 204. TECHNIC IN FIELD CROP RESEARCH. (2)

Second semester, alternate years. (Offered 1968-69.) Two lectures a week. Field plot technic, application of statistical analysis to agronomic data, and preparation of the research project.

AGRO 205. ADVANCED TOBACCO PRODUCTION. (2)

First semester, alternate years. (Offered 1969-70.) Two lectures a week. Prerequisite, permission of instructor. A study of the structural adaptation and chemical response of tobacco to environmental variations. Emphasis will be placed on the alkaloids and other unique components. (Street.)

AGRO 207. ADVANCED FORAGE CROPS. (2)

First semester, alternate years. (Offered 1968-69.) Two lectures a week. Prerequisite, BOTN 101, CHEM 31, or equivalent, or permission of instructor. A fundamental study of physiological and ecological responses of grasses and legumes to environmental factors, including fertilizer elements, soil moisture, soil temperature, air temperature, humidity, length of day, quality and intensity of light, wind movement, and defoliation practices. Relationship of these factors to life history, production, chemical and botanical composition, quality, and persistence of forages will be considered. (Decker.)

AGRO 208. RESEARCH METHODS. (2)

Second semester. Prerequisite, permission of staff. Development of research viewpoint by detailed study and report on crop research of the Maryland Experiment Station or review of literature on specific phases of a problem. (Staff.)

AGRO S210. CROPPING SYSTEMS. (1)

Summer session only. An advanced course primarily designed for teachers of vocational agriculture and county agents. It deals with outstanding problems and the latest developments in the field.
Additional courses under CROPS AND SOILS.

SOILS

AGRO 10. GENERAL SOILS. (4)

Second semester. Three lectures and one laboratory period a week. Prerequisite, CHEM 1 or permission of instructor. A study of the fundamentals of soils including their origin, development, relation to natural sciences, effect on civilization, physical properties, and chemical properties. (Foss.)

For Advanced Undergraduates and Graduates

AGRO S110. SOIL MANAGEMENT. (1)

Summer session only. An advanced course primarily designed for teachers of vocational agriculture and county agents dealing with factors involved in management of soils in general and of Maryland soils in particular. Emphasis is placed on methods of maintaining and improving chemical, physical, and biological characteristics of soils. (Strickling.)

AGRO 111. SOIL FERTILITY PRINCIPLES. (3)

First semester, alternate years. (Offered 1968-69.) Three lectures a week. Prerequisite, AGRO 10. A study of the chemical, physical, and biological characteristics of soils that are important in growing crops. Soil deficiencies of physical, chemical, or biological nature and their correction by the use of lime, fertilizers, and rotations are discussed and illustrated. (Strickling.)

AGRO 112. COMMERCIAL FERTILIZERS. (3)

Second semester. Three lectures a week. Prerequisites, AGRO 10 or permission of instructor. A study of the manufacturing of commercial fertilizers and their use in soils for efficient crop production. (Axley.)

AGRO 113. SOIL AND WATER CONSERVATION. (3)

First semester, alternate years. (Offered 1968-69). Two lectures and one laboratory period a week. Prerequisite, AGRO 10 or permission of instructor. A study of the importance and causes of soil erosion, methods of soil erosion control, and the effect of conservation practices on soil-moisture supply. Special emphasis is placed on farm planning for soil and water conservation. The laboratory period will be largely devoted to field trips. (Foss.)

AGRO 114. SOIL CLASSIFICATION AND GEOGRAPHY. (3)

Second semester. Three lectures and one laboratory period a week. Prerequisite, AGRO 10, or permission of instructor. A study of the genesis, morphology, classification and geographic distribution of soils. The broad principles governing soil formation are explained. Attention is given to the influence of geographic factors on the development and use of the soils in the United States and other parts of the world. The laboratory periods will be largely devoted to the field trips and to a study of soil maps of various countries. (Fanning.)

AGRO 115. SOIL SURVEY AND LAND USE. (3)

First semester alternate years. (Offered 1969-70). Two lectures and one two-hour laboratory a week. Prerequisite, AGRO 114 or consent of the instructor. An introduction to soil survey interpretation as a tool in land use both in agricultural and urban situations. The implications of soil problems as delineated by soil surveys on land use will be considered. (F. Miller.)

AGRO 116. SOIL CHEMISTRY. (3)

First semester, alternate years. (Offered 1968-69.) One lecture and two laboratory periods a week. Prerequisite, AGRO 10, or permission of instructor.

A study of the chemical composition of soils; cation and anion exchange; acid, alkaline and saline soil conditions; and soil fixation of plant nutrients. Chemical methods of soil analysis will be studied with emphasis on their relation to fertilizer requirements. (Axley.)

AGRO 117. SOIL PHYSICS. (3)

First semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory period a week. Prerequisite AGRO 10 and a course in physics, or permission of instructor. A study of physical properties of soils with special emphasis on relationship to soil productivity. (Strickling.)

AGRO 118. SOIL BIOCHEMISTRY. (3)

Second semester. Alternate years. (Offered 1969-70.) Two lectures and one two-hour laboratory. Prerequisite, AGRO 10, CHEM 33 or 37 and 38 or consent of instructor. A study of biochemical processes involved in the formation and decomposition of organic soil constituents. Significance of soil-biochemical processes involved in plant nutrition will be considered. (Staff.)

For Graduates

AGRO 250. ADVANCED SOIL MINERALOGY. (3)

First semester, alternate years. (Offered 1968-69.) Three lectures a week. Prerequisites, AGRO 10 and permission of instructor. A study of the structure physical-chemical characteristics and identification methods of soil minerals, particularly clay minerals, and their relationship to soil genesis and productivity. (Fanning.)

AGRO 251. ADVANCED METHODS OF SOIL INVESTIGATION. (3)

First semester, alternate years. (Offered 1969-70.) Three lectures a week. Prerequisites, AGRO 10 and permission of instructor. An advanced study of the theory of the chemical methods of soil investigation with emphasis on problems involving application of physical chemistry. (Axley.)

AGRO 252. ADVANCED SOIL PHYSICS. (3)

Second semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory period a week. Prerequisite, AGRO 10 and permission of instructor. An advanced study of physical properties of soils with special emphasis on relationship to soil productivity. (Strickling.)

AGRO 253. ADVANCED SOIL CHEMISTRY. (3)

Second semester, alternate years. Offered (1968-69.) One lecture and two laboratory periods a week. Prerequisite, permission of instructor. A continuation of AGRO 116 with emphasis on soil chemistry of minor elements necessary for plant growth. (Axley.)

Additional courses under CROPS AND SOILS.

CROPS AND SOILS

For Advanced Undergraduates

AGRO 198. SPECIAL PROBLEMS IN AGRONOMY. (1)

First and second semesters. Prerequisites, AGRO 10, 107, 108 or permission of instructor. A detailed study, including a written report of an important problem in agronomy. (Staff.)

AGRO 199. SENIOR SEMINAR. (1)

First semester. Reports by seniors on current scientific and practical publications pertaining to agronomy. (J. Miller.)

*For Graduates***AGRO 260. RECENT ADVANCES IN AGRONOMY. (2-4)**

First semester. Two hours each year. Total credit four hours. Prerequisite, permission of instructor. A study of recent advances in agronomy research. (Staff.)

AGRO 302. AGRONOMY SEMINAR. (1, 1)

First and second semesters. Total credit toward M. S. 2; toward Ph.D., 6. Prerequisite, permission of instructor. (Staff.)

AGRO 399. RESEARCH.

First and second semesters. Credit according to work done. (Staff.)

GEOLOGY**GEOL. 1. GEOLOGY. (3)**

First and second semester. Three lectures or two lectures and one laboratory each week. A study dealing primarily with the principles of dynamical and structural geology. Designed to give a general survey of the rocks and minerals composing the earth; the movement within it; and its surface features and the agents that form them. (Staff.)

GEOL 2. HISTORICAL AND STRATIGRAPHIC GEOLOGY. (3)

Second semester. Three lectures or two lectures and one laboratory each week. Prerequisite, GEOL 1. A study of the earth's history as revealed through the principles of stratigraphy and the processes of physical geology, with emphasis on the formations and the geologic development of the North American continent. (Fernow.)

GEOL 4. PHYSICAL GEOLOGY LABORATORY. (1)

First and second semesters. One three-hour laboratory a week. The basic materials and tools of physical geology, stressing familiarization with rocks and minerals, and the use of maps in geological interpretations. Designed to be taken concurrently with a specified lecture section of GEOL 1; GEOL 4 may also be elected, with permission of instructor, by students who have completed GEOL 1 with a grade of at least C, and who wish to prepare themselves for more advanced geology courses. (Staff.)

GEOL 120. CRYSTALLOGRAPHY. (3)

First semester, alternate years. (Offered 1969-70.) Two lectures and one two-hour laboratory. Prerequisite, CHEM 3 or consent of instructor. An introduction to the study of crystals. Stresses the theoretical and practical relationships between the internal and external properties of crystalline solids. Encompasses morphological, optical and chemical crystallography. (Siegrist.)

GEOL 121. MINERALOGY. (3)

Second semester, alternate years. (Offered 1969-70.) One lecture and two two-hour laboratories a week. Prerequisite, GEOL 120 or consent of instructor. Basic elementary mineralogy with emphasis on description, identification, formation, occurrence and economic significance of approximately 150 minerals. (Siegrist.)

GEOL 198. SPECIAL PROBLEMS IN GEOLOGY. (1-3)

First and second semesters. Prerequisites, GEOL 2 and 4, or equivalent, and consent of instructor. Intensive study of a special geologic subject or technique selected after consultation with instructor. Intended to provide training or instruction not available in other courses which will aid the student's development in his field of major interest. (Staff.)

ANIMAL SCIENCE

ANIMAL

Professors: FOSTER AND GREEN.

Associate Professors: BURIC, LEFFEL AND YOUNG.

DAIRY

Professors: DAVIS AND HEMKEN.

Associate Professors: WILLIAMS AND VANDERSALL.

Assistant Professor: FAIRCHILD.

POULTRY

Professors: SHAFFNER AND COMBS.

Associate Professor: CREEK.

Assistant Professor: BIGBEE.

VETERINARY SCIENCE

Associate Professors: NEWMAN AND WILLS.

Assistant Professor: ALBERT.

ANSC 1. PRINCIPLES OF ANIMAL SCIENCE. (3)

First semester. Two lectures and one, two-hour laboratory period per week. A comprehensive course, including the development of animal science, its contributions to the economy, characteristics of animal products, factors of efficient and economical production and distribution. (Young.)

ANSC 10. FEEDS AND FEEDING. (3)

First semester. Credit not allowed for ANSC major. Two lectures and one laboratory period per week. Prerequisites, CHEM 1 and 3. Elements of nutrition, source, characteristics and adaptability of the various feedstuffs to the several classes of livestock. A study of the composition of feeds, the nutrient requirements of farm animals and the formulation of economic diets and rations for livestock. (Leffel.)

ANSC 20. FUNDAMENTALS OF ANIMAL PRODUCTION. (3)

First semester. Two lectures and one laboratory period per week. This course deals with the adaptation of beef cattle, sheep, swine and horses to significant and specific uses. Breeding, feeding, management practices and criteria for evaluating usefulness are emphasized. (Young.)

ANSC 21. SEMINAR. (1)

First semester. One lecture per week. Reviews, reports and discussions of pertinent subjects in Animal Science. (Staff.)

ANSC 22. LIVESTOCK EVALUATION. (3)

Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 20 or permission of instructor. A study of type and breed characteristics of beef cattle, sheep and swine and of the market classes of livestock which best meet present day demands. One field trip of about two days duration is made during which students participate in the Annual Eastern Intercollegiate Livestock Clinic. (Buric.)

ANSC 40. DAIRY PRODUCTION. (3)

Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 1. A comprehensive course in dairy breeds, selection of dairy cattle, dairy cattle nutrients, feeding and management. (Hemken.)

ANSC 41. DAIRY CATTLE TYPE APPRAISAL. (1)

Second semester. Freshmen, by permission of instructor. Two laboratory periods. Analysis of dairy cattle type with emphasis on the comparative judging of dairy cattle. (Cairns.)

ANSC 61. ADVANCED POULTRY JUDGING. (1)

First semester. Prerequisite, ANSC 1. One lecture or laboratory period per week. The theory and practice of judging and culling by physical means is emphasized, including correlation studies of characteristics associated with productivity. Contestants for regional collegiate judging competitions will be selected from this class. (Bigbee.)

ANSC 62. COMMERCIAL POULTRY MANAGEMENT. (3)

Second semester. Prerequisite, ANSC 1. A symposium of finance, investment, plant layout, specialization, purchase of supplies and management problems in baby chick, egg, broiler and turkey production; foremanship, advertising, selling, by-products, production and financial records. Field trips required. (Bigbee.)

For Advanced Undergraduates and Graduates

ANSC 109. FUNDAMENTALS OF NUTRITION. (3)

Second semester. Three lectures per week. Prerequisite, CHEM 31. A study of the fundamental role of all nutrients in the body, including their digestion, absorption, and metabolism. Dietary requirements and nutritional deficiency syndromes of laboratory and farm animals and man will be considered. This course will be for both graduate and undergraduate credit, with additional assignments given to the graduate students. (Combs.)

ANSC 110. APPLIED ANIMAL NUTRITION. (3)

First semester. Two lectures and one laboratory period per week. Prerequisite, MATH 10, ANSC 109 or permission of instructor. A critical study of those factors which influence the nutritional requirements of ruminants, swine and poultry. Practical feeding methods and procedures used in formulation of economically efficient rations will be presented. (Vandersall.)

ANSC 116. ANATOMY OF DOMESTIC ANIMALS (3)

First semester. One lecture and two laboratory periods per week. A systematic comparative study of the pig, ruminants and fowl, with special emphasis of those systems important in animal production. Prerequisite, ZOOL 1. (Albert.)

ANSC 117. INTRODUCTION TO DISEASES OF ANIMALS. (3)

Second semester. Two lectures and one laboratory period per week. This course gives basic instruction in the nature of disease: including causation, immunity, methods of diagnosis, economic importance, public health aspects and prevention and control of the common diseases of sheep, cattle, swine, horses and poultry. Prerequisite, MICB 1 and ZOOL 1. (Albert.)

ANSC 118. WILDLIFE MANAGEMENT. (3)

Second semester. Two lectures and one laboratory. An introduction to the interrelationships of game birds and mammals with their environment, population dynamics and the principles of wildlife management. (Flyger.)

ANSC 119. LABORATORY ANIMAL MANAGEMENT. (3)

First semester. A comprehensive course in care and management of laboratory animals. Emphasis will be placed on physiology, anatomy and special uses for the different species. Disease prevention and regulations for maintaining animals colonies will be covered. Field trips will be required. (Staff.)

ANSC 120. ADVANCED LIVESTOCK JUDGING. (2)

First semester. Two laboratory periods per week. Prerequisites, ANSC 22 and permission of instructor. An advanced course in the selection and judging of purebred and commercial meat animals. The most adept students enrolled in this course are chosen to represent the University of Maryland in Inter-collegiate Livestock judging contests. (Buric.)

ANSC 121. MEATS. (3)

Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 20. Registration limited to 14 students. A course designed to give the basic facts about meat as a food and the factors influencing acceptability, marketing, and quality of fresh meats. It includes comparisons of characteristics of live animals with their carcasses, grading and evaluating carcasses as well as wholesale cuts, and the distribution and merchandising of the nation's meat supply. Laboratory periods are conducted in packing houses, meat distribution centers, and retail outlets. (Buric.)

ANSC 122. LIVESTOCK MANAGEMENT. (3)

First semester. One lecture and two laboratory periods per week. Prerequisite, ANSC 109. Application of various phases of animal science to the management and production of beef cattle, sheep and swine. (Foster.)

ANSC 123. LIVESTOCK MANAGEMENT. (3)

Second semester. One lecture and two laboratory periods per week. Prerequisite, ANSC 122. Applications of various phases of animal science to the management and production of beef cattle, sheep and swine. (Leffel.)

ANSC 130. PRINCIPLES OF BREEDING. (3)

Second semester. Three lectures per week. Prerequisites, ZOOL 6 or BOTN 117. Graduate credit (1-3 hours) allowed with permission of instructor. The practical aspects of animal breeding, heredity, variation, selection, development, systems of breeding and pedigree study are considered. (Green.)

ANSC S131. SPECIAL TOPICS IN ANIMAL SCIENCE. (1)

Prerequisite, permission of instructor. Summer session only. This course is designed primarily for teachers of vocational agriculture and Extension Service personnel. One primary topic, to be selected mutually by the instructor and students, will be presented each session.

ANSC 140. PHYSIOLOGY OF MAMMALIAN REPRODUCTION. (3)

First semester. Two lectures and one three-hour laboratory period per week. Prerequisite. ZOOL 102 or 104. The anatomy and physiology of the reproductive process and artificial insemination of cattle. (Williams.)

ANSC 141. PHYSIOLOGY OF MILK SECRETION. (2)

Second semester. One lecture and one three-hour laboratory period per week. Prerequisite. ZOOL 102 or 104. The anatomy and growth of the mammary gland and the metabolism and physiology of biosynthesis in the ruminant. (Williams.)

ANSC 142. DAIRY CATTLE BREEDING. (3)

Second semester. Two lectures and one laboratory period per week. Prerequisites, ANSC 40, ZOOL 6 or BOTN 117. A specialized course in breeding dairy cattle. Emphasis is placed on methods or evaluation and selection, systems of breeding and breeding programs. (Fairchild.)

ANSC S143. ADVANCED DAIRY PRODUCTION. (1)

Summer session only. An advanced course primarily designed for teachers of vocational agriculture and county agents. It includes a study of the newer discoveries in dairy cattle nutrition, breeding and management.

ANSC 162. AVIAN PHYSIOLOGY. (2)

First semester. One three-hour laboratory period per week. Prerequisites. ZOOL 102 or 104 and ANSC 116. The basic physiology of the bird is discussed, excluding the reproductive system. Special emphasis is given to physiological differences between birds and other vertebrates. (Wills.)

ANSC S163. POULTRY BREEDING AND FEEDING. (1)

Summer session only. This course is designed primarily for teachers of vocational agriculture and extension service workers. The first half will be devoted to problems concerning breeding and the development of breeding stock. The second half will be devoted to nutrition. (Combs.)

ANSC S164. POULTRY PRODUCTS AND MARKETING. (1)

Summer session only. This course is designed primarily for teachers of vocational agriculture and county agents. It deals with the factors affecting the quality of poultry products and with hatchery management problems, egg and poultry grading, preservation problems and market outlets for Maryland poultry. (Helbacka.)

ANSC 165. PHYSIOLOGY OF HATCHABILITY. (1)

Second semester. One, three-hour laboratory period per week. Prerequisite. ZOOL 102 or 104. The physiology of embryonic development as related to principles of hatchability and problems of incubation encountered in the hatchery industry are discussed. (Shaffner.)

ANSC 170. POULTRY HYGIENE. (3)

Second semester. Two lectures and one laboratory period per week. Prerequisites. MICB 1 and ANSC 1. Virus, bacterial and protozoan diseases; parasitic diseases, prevention, control and eradication. (Wills.)

ANSC 171. AVIAN ANATOMY. (3)

First semester. Two lectures and one laboratory per week. Prerequisite. ZOOL 1. Gross and microscopic structure, dissection and demonstration. (Wills.)

ANSC 198. SPECIAL PROBLEMS IN ANIMAL SCIENCE (1-2) (4 cr. max.)

First and second semester. Prerequisite, approval of staff. Work assigned in proportion to amount of credit. A course designed for advanced undergraduates in which specific problems relating to animal science will be assigned.
(Staff.)

ANSC 199. SEMINAR. (1, 1)

First and second semesters. Prerequisite, permission of staff. Presentation and discussion of current literature and research work in animal science. (Staff.)

*For Graduates***ANSC 200. ELECTRON MICROSCOPY. (4)**

First and second semesters. One lecture and two laboratory periods per week. Theory of the electron microscope, preparation of specimens, manipulations and photography.
(Mohanty.)

ANSC 220. ADVANCED BREEDING. (2)

Second semester. Two lectures per week. Prerequisites, ANSC 130 or equivalent and Biological Statistics. This course deals with the more technical phases of heredity and variation; selection indices; breeding systems; inheritance in farm animals.
(Green.)

ANSC 221. ENERGY AND PROTEIN NUTRITION. (3)

Second semester. Prerequisites, Chem. 31 and 33, or equivalent, ANSC 110, or permission of Instructor. Three lectures per week. A study of animal energetics and the basic descriptions of animals relative to the requirements for energy and protein. Literature dealing with nutrition research techniques and energy and protein utilization and requirements is surveyed.
(Leffel, Combs.)

ANSC 240. ADVANCED RUMINANT NUTRITION. (2)

First semester. One, one-hour lecture and one, two-hour laboratory per week. Prerequisite, permission of department. Biochemical physiological and bacteriological aspects of the nutrition of ruminants and other animals.
(Vandersall.)

ANSC 241. RESEARCH METHODS. (3)

The application of biochemical and biophysical methods in biological research with emphasis on animals and animal products.
(Keeney.)

ANSC 242. EXPERIMENTAL MAMMALIAN SURGERY, I. (2)

First semester. Prerequisites, ZOOL 102 or 104. Permission of instructor. A course presenting the fundamentals of anesthesia and the art of experimental surgery, especially to obtain research preparation.

ANSC 243. EXPERIMENTAL MAMMALIAN SURGERY, II. (3)

Second semester. Prerequisites, ANSC 242. Permission of instructor. A course emphasizing advanced surgical practice to obtain research preparations. cardiovascular surgery and chronic vascularly isolated organ techniques, experience with pump oxygenator systems, profound hypothermia, hemodialysis, infusion systems, implantation and transplantation procedures are taught

ANSC 261. PHYSIOLOGY OF REPRODUCTION. (3)

First semester. Two lectures and one laboratory period per week. Prerequisite, ZOOL 104 or its equivalent. The role of the endocrines in reproduction is considered. Fertility, sexual maturity, egg formation, ovulation and the physiology of oviposition are studied. Comparative mammalian functions are discussed. (Shaffner.)

ANSC 262. POULTRY LITERATURE. (1-4)

First and second semesters. Readings on individual topics are assigned. Written reports required. Methods of analysis and presentation of scientific material are discussed. (Staff.)

ANSC 263. POULTRY NUTRITION LABORATORY. (2)

First semester. One lecture and one laboratory period per week. To acquaint graduate students with common basic nutrition research techniques useful in conducting experiments with poultry. Actual feeding trials with chicks as well as bacteriological and chemical assays will be performed. (Creek.)

ANSC 264. VITAMINS. (2)

First semester. One lecture and one two-hour lab per week. Prerequisite, CHEM 161. Advanced study of the fundamental role of vitamins in nutrition, including their chemical properties, absorption, metabolism, storage, excretion and deficiency syndromes. A critical study of the biochemical basis of vitamin function, interrelationships of vitamins with other substances, and of certain special laboratory techniques. (Combs.)

ANSC 265. MINERAL METABOLISM. (2)

Second semester, alternate years (offered 1968). Two lectures per week. Prerequisites, CHEM 161, 163. The role of minerals in metabolism with special emphasis on the needs of man and animals. (Creek.)

ANSC 266. PHYSIOLOGICAL GENETICS OF DOMESTIC ANIMALS. (2)

Prerequisite, ZOOL 6, and a course in biochemistry. Underlying physiological bases for genetic differences in productive traits and selected morphological traits will be discussed. Inheritance will be studied on blood, enzymes, and protein polymorphisms and physiological traits.

ANSC 301. SPECIAL PROBLEMS IN ANIMAL SCIENCE (1-2) (4 cr. max.)

First and second semesters. Prerequisite, approval of staff. Work assigned in proportion to amount of credit. Problems will be assigned which relate specifically to the character of work the student is pursuing.

ANSC 302. SEMINAR. (1)

First and second semester. Students are required to prepare papers, based upon current scientific publications relating to Animal Science, or upon their research work, for presentation before and discussion by the class; (1) Recent advances; (2) Nutrition; (3) Physiology; (4) Biochemistry.

ANSC 399. RESEARCH. (1-12)

First and second semesters. Work assigned in proportion to amount of credit. Students will be required to pursue original research in some phase of animal science, carrying the same to completion, and report the results in the form of a thesis.

BOTANY

Head and Professor: KRAUSS.

Professors: BAMFORD, CORBETT, GAUCH, D. T. MORGAN, SISLER, STERN AND WEAVER.

Research Professor: SOROKIN.

Associate Professors: BROWN, GALLOWAY, KANTZES, KRUSBERG, LOCKARD, MANS, O. D. MORGAN AND RAPPLEYE.

Assistant Professor: BEAN, CURTIS, HARRISON, KARLANDER, KLARMAN, PATTERSON AND TERBORGH.

Research Associate: NORTON.

Instructors: EDWARDS, OWENS, PRITCHARD.

BOTN 1. GENERAL BOTANY. (4)

First and second semesters. Summer session. Two lectures and two laboratory periods a week. General introduction to botany, touching briefly on all phases of the subject. Emphasis is on the fundamental biological principles of the higher plants. (Stern and Departmental Faculty.)

BOTN 1H. GENERAL BOTANY. (4)

First and second semesters. Two lectures and two laboratory periods a week. A broad study of plant science with emphasis on current conceptions of major fields of interest. Designed for general honors students, as well as for freshman students with superior training in biology or chemistry, for upper class science majors, and for those students seeking an advanced treatment of Botany I. (Galloway and Departmental Faculty.)

BOTN 2. GENERAL BOTANY. (4)

Second semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 1 or equivalent. A brief evolutionary study of algae, fungi, liverworts, mosses, ferns and their relatives, and the seed plants, emphasizing their structure, reproduction, habitats, and economic importance.

BOTN 10. PRINCIPLES OF CONSERVATION. (3)

First semester. Three lectures per week. A study of the principles of economical use of our natural resources, including water, soil, plants, minerals, wildlife and man. (Harrison.)

BOTN 11. PLANT TAXONOMY. (3)

Second semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 1, or equivalent. An introductory study of plant classification, based on the collection and identification of local plants. (Brown.)

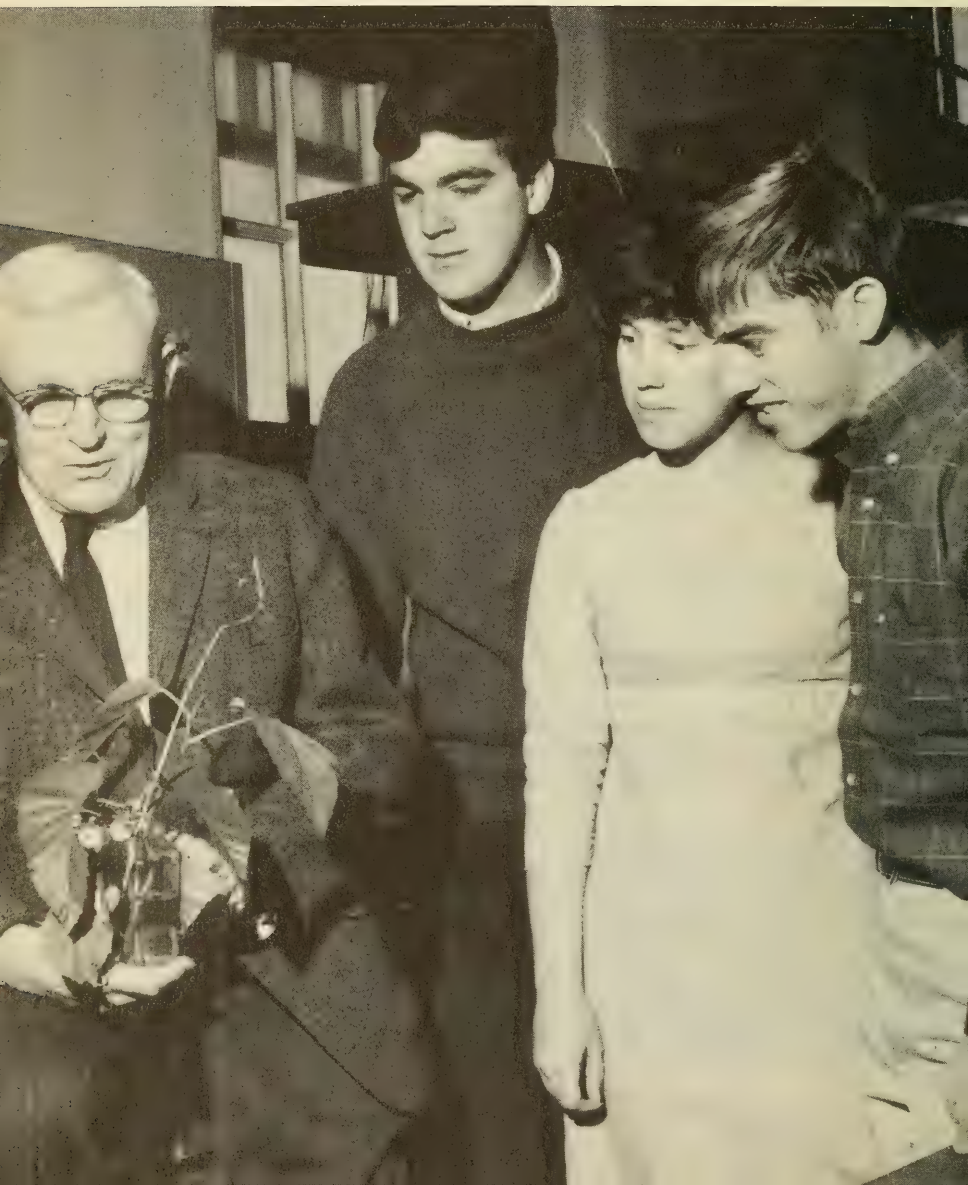
BOTN 20. DISEASES OF PLANTS. (4)

First semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 1, or equivalent. An introductory study of the symptoms and casual agents of plant diseases and measure for their control. (Klarman.)

*For Advanced Undergraduates and Graduates***BOTN 110. PLANT MICROTECHNIQUE. (3)**

Second semester. One lecture a week. Laboratory periods by arrangement. Prerequisite, BOTN 1 or equivalent and permission of instructor. Preparation of temporary and permanent mounts, including selection of material, killing and fixing, embedding, sectioning, and staining methods; photomicrography film and paper processing and preparation of photographic illustrations for research publication.

(Stern.)



BOTN 171. MARINE PLANT BIOLOGY. (4)

Summer session. Prerequisite, BOTN 1 or General Biology plus Organic Chemistry or the consent of the instructor. Five, one-hour lectures and three, 3-hour laboratories each week for six weeks. An introduction to the taxonomic, physiological and biochemical characteristics of marine plants which are basic to their role in the ecology of the oceans and estuaries. Laboratory fee \$12.00. (Krauss and Staff.)

BOTN 195. TUTORIAL READING IN BOTANY. (Honors Course) (2 or 3)

Prerequisite, admission to the Department of Botany Honors Program. A review of the literature dealing with a specific research problem in preparation for original research to be accomplished in Botany 196. Papers will be assigned and discussed in frequent sessions with the instructor.

(Galloway and Departmental Faculty.)

BOTN 196. RESEARCH PROBLEMS IN BOTANY. (Honors Course) (2 or 3)

Prerequisite, BOTN 195. The candidate for Honors will pursue a research problem under the direction and close supervision of a member of the faculty.

BOTN 199. SEMINAR. (1)

First and second semesters. Two semester hours maximum credit. Prerequisite, permission of instructor. Discussion and readings on special topics, current literature, or problems and progress in all phases of botany. Minor experimental work may be pursued if facilities and the qualifications of the students permit. For seniors only, majors and minors in botany or biological science. (Terborgh.)

PLANT PHYSIOLOGY*For Advanced Undergraduates and Graduates***BOTN 101. PLANT PHYSIOLOGY. (4)**

First semester. Two lectures and one 4-hour laboratory period a week. Prerequisites, BOTN 1 and General Chemistry. Organic Chemistry strongly recommended. A survey of the general physiological activities of plants. (Patterson.)

BOTN 102. PLANT ECOLOGY. (2)

Second semester. Prerequisite, BOTN 1. Two lectures per week. The dynamics of populations as affected by environmental factors with special emphasis on the structure and composition of natural plant communities, both terrestrial and aquatic. (Terborgh.)

BOTN 103. PLANT ECOLOGY LABORATORY. (1)

Prerequisite, BOTN 102 or its equivalent or concurrent enrollment therein. One three-hour laboratory period a week. The application of field and experimental methods to the qualitative and quantitative study of vegetation and environmental factors. (Terborgh.)

BOTN 204. GROWTH AND DEVELOPMENT. (2)

First semester. (Not offered 1969-70.) Prerequisite, 12 semester hours of plant science. A study of current developments in the mathematical treatment of growth and the effects of radiation, plant hormones, photoperiodism, and internal biochemical balance during the development of the plant. (Krauss.)

BOTN 209. PHYSIOLOGY OF ALGAE. (2)

Second semester. (Not offered 1969-70.) Prerequisite, BOTN 231, the equivalent in allied fields, or permission of the instructor. A study of the physiology and comparative biochemistry of the algae. Laboratory techniques and recent advances in algal nutrition, photosynthesis, and growth will be reviewed.

(Krauss.)

BOTN 210. PHYSIOLOGY OF ALGAE—LABORATORY. (1)

Second semester. (Not offered 1969-70.) One laboratory period a week. Prerequisites, previous or concurrent enrollment in BOTN 209, and permission of instructor. Special laboratory techniques involved in the study of algal nutrition.

(Krauss.)

BOTN 219. ADVANCED PLANT ECOLOGY. (3)

Fall semester. (Not offered 1969-70.) Prerequisite, BOTN 102 or equivalent and permission of instructor. Discussion of current developments in ecology, with emphasis on quantitative and radioecological techniques and the energy exchanges in ecological systems. Field trips and problems will be arranged.

(Terborgh.)

BOTN 230. ADVANCED PLANT PHYSIOLOGY. (2)

First semester. Prerequisites, BOTN 101 or equivalent, and Organic Chemistry. A presentation of the metabolic processes occurring in plants, including the roles of the essential elements in these processes with special emphasis on recent literature.

(Patterson.)

BOTN 231. PLANT BIOCHEMISTRY. (2)

Second semester. (Not offered 1968-69.) Prerequisite, BOTN 230. A treatment of those aspects of biochemistry especially pertinent to plants—respiration, photosynthesis, and organic transformations.

(Galloway.)

BOTN 232. PLANT BIOPHYSICS. (2)

Second semester. (Not offered 1968-69.) Prerequisites, BOTN 230 and at least one year of Physics. An advanced course dealing with the operation of physical phenomena in plant life processes.

(Karlander.)

BOTN 233. PLANT BIOCHEMISTRY-BIOPHYSICS LABORATORY. (4)

Second semester. (Not offered 1968-69.) Prerequisites, BOTN 230 and one year of Physics. Application of physical and chemical techniques and instrumentation to the study of plants. Two four-hour laboratory periods per week.

(Karlander and Galloway.)

PLANT MORPHOLOGY, CYTOLOGY AND TAXONOMY*For Advanced Undergraduates and Graduates***BOTN 111. PLANT ANATOMY. (3)**

First semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 110, or equivalent. The origin and development of the organs and tissue systems in the vascular plants.

(Rapplee.)

BOTN 113. PLANT GEOGRAPHY. (2)

First semester. Prerequisite, BOTN 1, or equivalent. A study of plant distribution throughout the world and the factors generally associated with such distribution.

(Brown.)

BOTN 115. STRUCTURE OF ECONOMIC PLANTS. (3)

Second semester. (Not offered 1969-70.) One lecture and two laboratory periods a week. Prerequisite, BOTN 111. A detailed microscopic study of the anatomy of the chief fruit and vegetable crops. (Rappleye.)

BOTN 116. HISTORY AND PHILOSOPHY OF BOTANY. (1)

First semester. Prerequisites, 20 semester hours credit in biological sciences, including BOTN 1 or equivalent. Discussion of the development and ideas and knowledge about plants, leading to a survey of contemporary work in botanical science. (Bamford.)

BOTN 117. GENERAL PLANT GENETICS. (2)

Second semester. Prerequisite, BOTN 1 or equivalent. The basic principles of plant genetics are presented; the mechanics of transmission of the hereditary factors in relation to the life cycle of seed plants, the genetics of specialized organs and tissues, spontaneous and induced mutations of basic and economic significance, gene action, genetic maps, the fundamentals of polyploidy, and genetics in relation to methods of plant breeding are the topics considered. (Mans.)

BOTN 136. PLANTS AND MANKIND. (2)

First semester. Prerequisite, BOTN 1 or equivalent. A survey of the plants which are utilized by man, the diversity of such utilization, and their historic and economic significance. (Rappleye.)

BOTN 151S. TEACHING METHODS IN BOTANY. (2)

Summer session. Four two-hour laboratory demonstration periods per week, for eight weeks. Prerequisite, BOTN 1, or equivalent. A study of the biological principles of common plants, and demonstrations, projects, and visual aids suitable for teaching in primary and secondary schools. (Lockard.)

BOTN 153. FIELD BOTANY AND TAXONOMY. (2)

Summer session. Prerequisite, BOTN 1 or General Biology. Four two-hour laboratory periods a week for eight weeks. The identification of trees, shrubs, and herbs, emphasizing the native plants of Maryland. Manuals, keys, and other techniques will be used. Numerous short field trips will be taken. Each student will make an individual collection. (Brown.)

BOTN 161. SYSTEMATIC BOTANY. (2)

Fall semester. (Not offered 1968-69.) Two two-hour laboratory periods a week. Prerequisite, BOTN 11 or equivalent. An advanced study of the principles of systematic botany. Laboratory practice with difficult plant families including grasses, sedges, legumes, and composites. Field trips arranged. (Brown.)

For Graduates**BOTN 211. CYTOLOGY. (4)**

First semester. (Not offered 1969-70.) Two lectures and two laboratory periods a week. Prerequisite, introductory genetics. A detailed study of the chromosomes in mitosis and meiosis, and the relation of these to current theories of heredity and evolution. (Bamford, D. T. Morgan.)

BOTN 212. PLANT MORPHOLOGY. (3)

Second semester. One lecture and two laboratory periods a week. Prerequisites. BOTN 11, BOTN 111, or equivalent. A comparative study of the morphology of the flowering plants, with special reference to the phylogeny and development of floral organs. (Rappleye.)

BOTN 215. PLANT CYTOGENETICS. (3)

First semester. (Not offered 1968-69.) Two lectures and one laboratory period a week. Prerequisite, introductory genetics. An advanced study of the current status of plant genetics, particularly gene mutations and their relation to chromosome changes in corn and other favorable materials. (D. T. Morgan.)

PLANT PATHOLOGY*For Advanced Undergraduates and Graduates***BOTN 122. RESEARCH METHODS IN PLANT PATHOLOGY. (2)**

Second semester. Two laboratory periods a week. Prerequisite, BOTN 20, or equivalent. Advanced training in the basic research techniques and methods of plant pathology. (Curtis.)

BOTN 127. DIAGNOSIS AND CONTROL OF PLANT DISEASES. (3)

Second semester. Three lectures per week. A study of various plant diseases grouped according to the manner in which the host plants are affected. Emphasis will be placed on recognition of symptoms of the various types of diseases and on methods of transmission and control of the pathogens involved. (Bean.)

BOTN 128. MYCOLOGY. (4)

Second semester. (Not offered 1969-70.) An introductory study of the morphology, classification, life histories, and economics of the fungi.

BOTN 152S. FIELD PLANT PATHOLOGY. (1)

Summer session. Daily lecture for three weeks. Prerequisite, BOTN 20, or equivalent. Given in accordance with demand. A course for county agents and teachers of vocational agriculture. Discussion and denomination of the important diseases in Maryland crops. (Kantzes.)

*For Graduates***BOTN 221. PLANT VIROLOGY. (2)**

First semester. (Not offered 1969-70.) Two lectures and one laboratory period a week. Prerequisites, BOTN 20 and BOTN 101 or equivalent. Consideration of the biological, biochemical and biophysical aspects of plant viruses and virus diseases. (Corbett.)

BOTN 222. PLANT VIROLOGY LABORATORY. (2)

Second semester. (Offered 1968-69.) Laboratory fee \$20.00. Two laboratories per week on the application and techniques for studying the biological, biochemical, and biophysical aspects of plant viruses. Prerequisites, Bachelor's degree or equivalent in any biological science and BOTN 221 or concurrent registration therein, and permission of the instructor. (Staff.)

BOTN 223. PHYSIOLOGY OF FUNGI. (2)

First semester. (Not offered 1969-70.) Prerequisites, Organic Chemistry and BOTN 101 or the equivalent in bacterial or animal physiology. A study of

various aspects of fungal metabolism, nutrition, biochemical transformations, fungal products, and mechanism of fungicidal action. (Sisler.)

BOTN 224. PHYSIOLOGY OF FUNGI LABORATORY. (1)

First semester. (Not offered 1969-70.) One laboratory period per week. Prerequisite, BOTN 223 or concurrent registration therein. Application of equipment and techniques in the study of fungal physiology. (Sisler.)

BOTN 227. PHYSIOLOGY OF PATHOGENS AND HOST-PATHOGEN RELATIONSHIPS. (3)

(Not offered 1968-69.) Three lecture periods a week. A study of enzymes, toxins, and other factors involved in pathogenicity and the relationship of host-pathogen interaction to disease development. (Curtis, Staff.)

BOTN 241. PLANT NEMATOLOGY. (4)

Second semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 20 or permission of instructor. (Not offered 1968-69.) The study of plant-parasitic nematodes, their morphology, anatomy, taxonomy, genetics, physiology, ecology, host-parasite relations and control. Recent advances in this field will be emphasized. (Krusberg.)

BOTN 301. SPECIAL PROBLEMS IN BOTANY. (1 to 3)

First and second semester. Credit according to time scheduled and organization of course. Maximum credit toward an advanced degree for the individual student at the discretion of the Department. This course may be organized as a lecture series on a specialized advanced topic, or may consist partly, or entirely, of experimental procedures. It may be taught by visiting lecturers, or by resident staff members. Problems or topics may be in: 1—Physiology; 2—Ecology; 3—Pathology; 4—Mycology; 5—Nematology; 6—Cytology; 7—Cytogenetics; 8—Morphology; 9—Anatomy; or 10—Taxonomy. (Staff.)

BOTN 302. SEMINAR IN BOTANY. (1)

First and second semesters. Prerequisite, permission of the instructor. Discussion of special topics and current literature in all phases of botany. (Staff.)

BOTN 399. RESEARCH

Credit according to work done. A minimum of 6 credit hours is required for the M.S. degree, and an additional minimum of 12 hours is required for the Ph.D. degree. Students must be qualified to pursue with profit the research to be undertaken. (Staff.)

ENTOMOLOGY

Professors: BICKLEY AND JONES.

Associate Professors: HARRISON AND MESSERSMITH.

Assistant Professors: DAVIDSON, DIETZ AND MENZER.

Lecturer: HEIMPEL.

ENTM 4. BEEKEEPING. (2)

First semester. A study of the life history, behavior and seasonal activities of the honeybee, its place in pollination of flowers with emphasis on plants of economic importance and bee lore in literature. (Dietz.)

ENTM 5. INSECTS. (3)

First and second semesters. A survey of the major groups of insects, their natural history, and their relationships with man and his environment.

(Messersmith.)

ENTM 15. INTRODUCTORY ENTOMOLOGY. (3)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, one semester of college zoology. The position of insects in the animal kingdom, their gross structure, classification into orders and principal families and the general economic status of insects. A collection of common insects is required.

(Messersmith.)

ENTM 20. INSPECT PESTS OF AGRICULTURAL CROPS. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisites, ZOOL 1 and BOTN 1. The recognition, biology, and control of insects injurious to fruit and vegetable crops, field crops and stored products.

(Harrison.)

ENTM 100. ADVANCED APICULTURE. (3)

Second semester. One lecture and two three-hour laboratory periods a week. Prerequisite, ENTM 4. The theory and practice of apiary management. Designed for the student who wishes to keep bees or requires a practical knowledge of bee management.

(Dietz.)

ENTM 105. MEDICAL AND VETERINARY ENTOMOLOGY. (4)

Second semester. Two lectures and one two-hour laboratory period a week. Prerequisite, ENTM 1 or consent of the Department. A study of the morphology, taxonomy, biology and control of the arthropod parasites and disease vectors of man and animals. The ecology and behavior of vectors in relation to disease transmission will be emphasized.

(Staff.)

ENTM 107. INSECTICIDES. (2)

Second semester. Prerequisite, consent of the Department. The development and use of contact and stomach poisons, fumigants and other important chemicals, with reference to their chemistry, toxic action, compatibility, and host injury. Recent research emphasized.

(Menzer.)

ENTM 116. INSECT PESTS OF ORNAMENTAL AND GREENHOUSE PLANTS. (3)

Second semester. Two lectures and one two-hour laboratory period a week. Prerequisites, BOTN 1 and ZOOL 1. The recognition, biology, and control of insects injurious to plants grown in ornamental plantings, nurseries, and under glass.

(Davidson.)

ENTM 120. INSECT TAXONOMY AND BIOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, ENTM 15. Introduction to the principles of systematic entomology and the study of all orders and the important families of insects; immature forms considered.

(Davidson.)

ENTM S 121. ENTOMOLOGY FOR SCIENCE TEACHERS. (4)

Summer. Four lectures and four three-hour laboratory periods a week. This course will include the elements of morphology, taxonomy and biology of in-

sects using examples commonly available to high school teachers. It will include practice in collecting, preserving, rearing and experimenting with insects insofar as time will permit. (Davidson.)

ENTM 122. INSECT MORPHOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, ENTM 15. A basic study of insect form, structure and organization in relation to function. (Davidson.)

ENTM 123. INSECT PHYSIOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, ENTM 15, CHEM 31 or equivalent. Lectures and laboratory exercises on the cuticle, growth, endocrines, muscles, circulation, nerves, digestion, excretion and reproduction in insects. (Jones.)

ENTM 198. SPECIAL PROBLEMS. (1-3)

First and second semesters. Credit and prerequisites, to be determined by the Department. Investigations of assigned entomological problems. (Staff.)

ENTM 199. SEMINAR. (1, 1)

First and second semesters. Prerequisite, senior standing. Presentation of original work, reviews and abstracts of literature. (Staff.)

For Graduates

ENTM 205. INSECT ECOLOGY. (2)

Second semester. One lecture and one two-hour laboratory period a week. Prerequisite, consent of the Department. A study of fundamental factors involved in the relationship of insects to their environment. Emphasis is placed on the insect as a dynamic organism adjusted to its surroundings. (Harrison.)

ENTM 206. CULICIDIOLOGY. (2)

Second semester, alternate years. One lecture and one three-hour laboratory period a week. The classification, distribution, ecology, biology, and control of mosquitoes. (Bickley.)

ENTM 208. TOXICOLOGY OF INSECTICIDES. (4)

First semester, alternate years. Three lectures and one three-hour laboratory period a week. Prerequisite, CHEM 31 or permission of instructor. A study of the physical, chemical and biological properties of insecticides. Emphasis is placed on the relationship of chemical structure to insecticidal activity and mode of action. Mechanisms of resistance are also considered. (Menzer.)

ENTM 209. ADVANCES IN INSECT PHYSIOLOGY. (2)

First semester, alternate years. Two lectures a week. Prerequisites, ENTM 123 or consent of instructor. Lectures on current literature with reading assignments and discussion. (Jones.)

ENTM 210. ENTOMOLOGICAL TOPICS. (Credit arranged)

First and second semesters. One lecture or one two-hour laboratory a week for each credit hour. Prerequisite, consent of Department. Lectures, group discussions or laboratory sessions on selected topics such as: Aquatic Insects.

Biological Control of Insects, Entomological Literature, Forest Entomology, History of Entomology, Insect Biochemistry, Insect Embryology, Immature Insects, Insect Behavior, Principles of Economic Entomology, Insect Communication, Principles of Entomological Research. (Staff and visiting lecturers.)

ENTM 301. ADVANCED ENTOMOLOGY. (1-6)

Credit and prerequisites to be determined by the Department. First and second semesters. Studies of minor problems in morphology, taxonomy and applied entomology, with particular reference to the preparation of the student for individual research. (Staff.)

ENTM 399. RESEARCH.

First and second semesters. Required of graduate students majoring in entomology. This course involves research on an approved project. A dissertation suitable for publication must be submitted at the conclusion of the studies as a part of the requirement for an advanced degree. (Staff.)

FOOD SCIENCE

Professors: FOSTER (Animal Science); DAVIS, ARBUCKLE AND KEENEY (Dairy Science); STARK,⁵ KRAMER AND SCOTT (Horticulture); SHAFFNER (Poultry Science).

Associate Professors: BURIC (Animal Science); KING AND MATTICK (Dairy Science); WILEY (Horticulture); HELBACKA (Poultry Science).

FDSC 1. INTRODUCTION TO FOOD SCIENCE. (3)

Second semester. Two lectures and one laboratory per week. An introductory course to orient the student in the broad field of food science. Includes a historical and economic survey of the major food industries, composition and nutritive value, quality aspects, spoilage, preservation, sanitation, standards and regulation of foods. (Mattick.)

For Advanced Undergraduates and Graduates

FDSC 102. PRINCIPLES OF FOOD PROCESSING—I. (3)

Second semester. Two lectures and one laboratory per week. A study of the basic methods by which foods are preserved (unit operations). Effect of raw product quality and the various types of processes on yield and quality of the preserved products. (Wiley.)

FDSC 103. PRINCIPLES OF FOOD PROCESSING—II. (3)

First semester. Three lectures per week. A detailed study of food processing with emphasis on line and staff operations, including physical facilities, utilities, pre- and post-processing operations, processing line development and sanitation. (Mattick.)

FDSC 111. FOOD CHEMISTRY. (3)

First semester. Two lectures and one laboratory per week. Prerequisite, CHEM 33. The application of basic chemical and physical concepts to the composition

⁵ Chairman of Curriculum Committee.

and properties of foods. Emphasis will be on the relationship of processing technology on the keeping quality, nutritional value and acceptability of foods. (King.)

FDSC 112. ANALYTICAL QUALITY CONTROL. (3)

Second semester. Two lectures and one laboratory per week. Prerequisite CHEM 33. Instrumental and sensory measurement of food quality attributes including appearance, rheological, flavor, and microbiological evaluations, and their integration into grades and standards of quality. (Kramer.)

FDSC 113. STATISTICAL QUALITY CONTROL. (3)

First semester. Two lectures and one laboratory per week. Prerequisite AGRI 100. Statistical methods for acceptance sampling of supplies and raw materials, in-plant and finished product inspection, water, fuel, and waste control, production, transportation, inventory and budget controls. (Kramer.)

FDSC 125. MEAT AND MEAT PROCESSING. (3)

First semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory per week. Prerequisite CHEM 161 or permission of instructor. Physical and chemical characteristics of meat and meat products, meat processing, methods of testing and product development.

FDSC 131. FOOD PRODUCT RESEARCH AND DEVELOPMENT. (3)

Second semester. Two lectures, one laboratory per week. Prerequisite FDSC 103, CHEM 163, or permission of instructor. A study of the research and development function for improvement of existing products and development of new, economically feasible and marketable food products. Application of chemical-physical characteristics of ingredients to produce optimum quality products, cost reduction, consumer evaluation, equipment and package development. (Mattick and staff.)

FDSC 156. HORTICULTURAL PRODUCTS PROCESSING. (3)

Second semester, alternate years. (Offered 1968-69.) Two lectures and one laboratory per week. Laboratory fee \$5.00. Commercial methods of canning, freezing, dehydrating, fermenting, and chemical preservation of fruit and vegetable crops. (Wiley.)

FDSC 160. TECHNOLOGY OF MARKET EGGS AND POULTRY. (3)

First semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory per week. A study of the technological factors concerned with the processing, storage, and marketing of eggs and poultry and the factors affecting their quality. (Helbacka.)

FDSC 175. SEAFOOD PRODUCTS PROCESSING. (3)

Second semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory a week. Prerequisite, CHEM 163 or permission of instructor. Laboratory fee, \$5.00. The principal preservation methods for commercial seafood products with particular reference to the invertebrates. Chemical and microbiological aspects of processing are emphasized. (Tatro.)

FDSC 182. DAIRY PRODUCTS PROCESSING. (3)

First semester, alternate years. (Offered 1968-69.) Two lectures and one laboratory per week. Method of production of fluid milk, butter, cheese, condensed and evaporated milk and milk products and ice cream. (Mattick.)

FDSC 198. SPECIAL PROBLEMS IN FOOD SCIENCE. (2, 2) (4 cr. max.)

First and second semesters. Prerequisite, approval of staff. Designed for advanced undergraduates in which specific problems in food science will be assigned. (Staff.)

FDSC 199. SEMINAR. (1)

Second semesters. Presentation and discussion of current literature and research in food science. (Staff.)

MECHANICS OF FOOD PROCESSING.

See Agricultural Engineering, AGEN 113.

EXPERIMENTAL FOOD SCIENCE.

See Food and Nutrition, FOOD 153.

For Graduates

FDSC 201. ADVANCES IN FOOD TECHNOLOGY. (3)

First semester, alternate years. (Offered 1968-69.) Prerequisite, CHEM 161 or permission of instructor. A systematic review of new products, processes and management practices in the food industry. (Kramer.)

FDSC 301. SPECIAL PROBLEMS IN FOOD SCIENCE. (1 to 4)

First and second semester. Prerequisite CHEM 161 or permission of instructor. Credit according to time scheduled and magnitude of problem. An experimental program on a topic other than the student's thesis problem will be conducted. Four credits shall be the maximum allowed toward an advanced degree. (Staff.)

FDSC 302. SEMINAR IN FOOD SCIENCE. (3)

First or second semesters. Prerequisite CHEM 163. A study in depth of a selected phase of food science.

- | | |
|----------------------------|-------------------------------|
| A) Lipids | E) Fermentation |
| B) Proteins | F) Enzymes and Microorganisms |
| C) Carbohydrates | in Food Synthesis |
| D) Organoleptic Properties | (Staff.) |

FDSC 310. COLLOQUIUM IN FOOD SCIENCE. (1)

First and second semester. Oral reports on special topics or recently published research in food science and technology. Distinguished scientists are invited as guest lecturers. A maximum of three credits allowed for the M.S. (Staff.)

FDSC 399. THESIS RESEARCH. (1-12)

First and second semesters; summer session. The investigation is planned and conducted under faculty supervision. Grades are awarded on completion of the thesis. (Staff.)

Methods of Horticultural Research, see Horticulture, HORT 207.

Research Methods, see Animal Science, ANSC 241.

Recent Advances in Nutrition, see Home Economics, NUTR 204.

HORTICULTURE

Professors: HAUT, KRAMER, LINK, REYNOLDS, SCOTT, SHANKS, STARK, AND THOMPSON.

Associate Professors: SNYDER AND WILEY.

Assistant Professors: ANGELL, BAKER AND SOERGEL.

HORT 5. TREE FRUIT PRODUCTION. (3)

First semester. Prerequisite BOTN. 1. Two lectures and one laboratory per week. A detailed study of the principles and practices in fruit production, harvesting, and storage, with emphasis on the apple. One field trip required.

(Thompson.)

HORT 6. TREE FRUIT PRODUCTION. (2)

Second semester. (Offered 1969-70.) Two lectures per week. Prerequisite HORT 5. A study of the principles and practices in fruit production, harvesting, and handling of deciduous tree fruit crops other than the apple.

(Thompson.)

HORT 11. GREENHOUSE MANAGEMENT. (3)

First semester. Three lectures per week. Prerequisite BOTN 1. A study of the construction and operation of structures for forcing horticultural crops and the principles underlying the regulation of plant growth under greenhouse conditions.

(Shanks.)

HORT 12. GREENHOUSE MANAGEMENT LABORATORY. (1)

First semester. One two-hour laboratory per week. Prerequisite or concurrent HORT 11. Demonstration and application of practices in the commercial production of greenhouse crops.

(Shanks.)

HORT 16. GARDEN MANAGEMENT. (3)

Second semester. Two lectures per week. Prerequisite BOTN 1. The planting and care of ornamental plants on the home grounds and a study of commonly used species of annuals and herbaceous perennials.

(Baker.)

HORT 17. FLOWER PRODUCTION LABORATORY. (1)

Second semester. One two-hour laboratory per week. Prerequisite or concurrent HORT 11 or 16. Demonstration and application of practices in the production of garden and greenhouse plants.

(Link.)

HORT 20. INTRODUCTION TO THE ART OF LANDSCAPING. (3)

First and second semesters. Three lectures per week. The theory and general principles of landscape design with their application to public and private areas.

(Soergel.)

HORT 30. ELEMENTS OF FORESTRY. (3)

Second semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory period per week. Prerequisite BOTN 1. Not open to freshmen. A general survey of the field of forestry, including timber values, conservation, protection silviculture, utilization, mensuration, engineering, recreation and lumbering. Principles and practices of woodland management.

HORT 56. BASIC LANDSCAPE COMPOSITION. (2)

First and second semesters. Two laboratory periods per week. The introduction of landscaping presentation technique, supplemented by problems in basic composition.

(Soergel.)

HORT 58. VEGETABLE PRODUCTION. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite, BOTN 1. A study of principles and practices of commercial vegetable production. (Reynolds.)

HORT 59. BERRY PRODUCTION. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite, BOTN 1. A study of the principles and practices involved in the production of small fruits including grapes, strawberries, raspberries, blackberries, and cranberries. (Angell.)

HORT 62. PLANT PROPAGATION. (3)

First semester. Three lectures per week. Prerequisite BOTN 1. A study of the principles and practices of the propagation of plants. (Baker.)

HORT 63. FLOWER STORE MANAGEMENT. (3)

Second semester, alternate years. (Offered 1968-69.) Two lectures and laboratory periods a week. Prerequisite, HORT 11. A study of the operation and management of a flower store. Laboratory period devoted to principles and practice of floral arrangements and decoration. (Link.)

For Advanced Undergraduates

HORT 100. PRINCIPLES OF LANDSCAPE DESIGN. (3)

First semester. One lecture and two laboratory periods per week. Prerequisite HORT 20 and HORT 56. A consideration of design criteria and procedure as applied to residential properties. (Soergel.)

HORT 152. ADVANCED LANDSCAPE DESIGN. (3)

Second semester, alternate years. (Offered 1968-69.) One lecture and two laboratory periods per week. Prerequisite HORT 100, prerequisite or concurrent HORT 108. The design of public and private areas with the major emphasis on plant materials. (Soergel.)

HORT 153. LANDSCAPE CONSTRUCTION. (3)

Second semester, alternate years. (Offered 1969-70.) One lecture and two laboratory periods per week. Prerequisite HORT 100. An introductory study and application of location methods, construction details, and construction techniques of the various landscape objects such as walks, walls, benches, roads. (Soergel.)

HORT 198. SPECIAL PROBLEMS. (2, 2) (4 cr. max.)

First and second semesters. Credit arranged according to work done. For major students in horticulture or botany. Four credits maximum per student. (Staff.)

HORT 199. SEMINAR. (1)

Second semester. Oral presentation of the results of investigational work by reviewing recent scientific literature in the various phases of horticulture. (Stark.)

For Advanced Undergraduates and Graduates

HORT 101. TECHNOLOGY OF FRUITS. (3)

First semester. (Offered 1968-69.) Three lectures per week. Prerequisite HORT 6; prerequisite or concurrent BOTN 101. A critical analysis of research work

and application of the principles of plant physiology, chemistry, and botany to practical problems in commercial production. (Thompson.)

HORT 103. TECHNOLOGY OF VEGETABLES. (3)

Second semester. (Offered 1969-70.) Three lectures per week. Prerequisite HORT 58; prerequisite or concurrent BOTN 101. A critical analysis of research work and application of the principles of plant physiology, chemistry, and botany to practical problems of commercial vegetable production. (Reynolds.)

HORT 105. TECHNOLOGY OF ORNAMENTALS. (3)

First semester. Three lectures per week. Prerequisite or concurrent BOTN 101. A study of the physiological processes of the plant as related to the growth, flowering and storage of ornamental plants. (Link.)

HORT 107, 108. WOODY PLANT MATERIALS. (3, 3)

First and second semesters. Prerequisite, BOTN 11. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings. (Baker.)

HORT 109. PRINCIPLES OF BREEDING HORTICULTURAL PLANTS. (3)

Second semester. Alternate years. Three lectures per week. Prerequisite, BOTN 117 or permission of instructor. The genetic and cytogenetic basis of plant breeding. Systems of pollination control, theories of selection, heterosis and quantitative inheritance; mutation breeding; interspecific hybridization, induced polyploidy and haploidy. (Snyder.)

HORT 114. SYSTEMATIC HORTICULTURE. (3)

First semester. Two lectures and one laboratory period a week. A study of the origin, taxonomic relationship and horticultural classification of fruits and vegetables. (Angell.)

HORT S115. TRUCK CROP MANAGEMENT. (1)

Summer session only. Primarily designed for teachers of vocational agriculture and extension agents. Special emphasis will be placed upon new and improved methods of production of the leading truck crops. Current problems and their solution will receive special attention.

HORT S124. TREE AND SMALL FRUIT MANAGEMENT. (1)

Summer session only. Primarily designed for vocational agriculture teachers and county agents. Special emphasis will be placed upon new and improved commercial methods of production of the leading tree and small fruit crops. Current problems and their solution will receive special attention.

HORT S125. ORNAMENTAL HORTICULTURE. (1)

Summer session only. A course designed for teachers of agriculture and extension agents to place special emphasis on problems of the culture and use of ornamental plants.

HORT 161. PHYSIOLOGY OF MATURATION AND STORAGE OF HORTICULTURAL CROPS. (2)

Second semester, alternate years. (Offered 1968-69.) Two lectures a week. Prerequisite, BOTN 101. Factors related to maturation and application of scientific principles to handling and storage of horticultural crops. (Scott.)

HORT 162. FUNDAMENTALS OF GREENHOUSE CROP PRODUCTION. (3)

Second semester. Three lectures per week. Prerequisite HORT 11. This course deals with a study of the commercial production and marketing of ornamental plant crops under greenhouse, plastic houses and out-of-door conditions.

(Shanks.)

HORT 163. PRODUCTION AND MAINTENANCE OF WOODY PLANTS. (3)

Second semester, alternate years. (Offered 1969-70.) Two lectures and one laboratory period a week. Prerequisite or concurrent HORT 62; 108. A study of the production methods and operation of a commercial nursery and the planting and care of woody plants in the landscape.

(Link.)

*For Graduates***HORT 207. METHODS OF HORTICULTURAL RESEARCH. (3)**

Second semester. One lecture and one four-hour laboratory period a week. The application of biochemical and biophysical methods to problems in biological research with emphasis on plant materials.

(Scott.)

HORT 211. EDAPHIC FACTORS AND HORTICULTURAL PLANTS. (3)

First semester. Alternate years. Three lectures per week. Prerequisite, BOTN 101. A critical study of scientific literature and current research concerning factors of the soil affecting production of horticultural plants. Selected papers are studied and critically discussed. Attention is given to experimental procedures, results obtained, interpretation of the data, and to evaluation of the contribution.

(Reynolds.)

HORT 212. CHEMICAL REGULATION OF GROWTH OF HORTICULTURAL PLANTS. (3)

Second semester. Alternate years. Three lectures per week. Prerequisite, BOTN 101. A critical review of literature and current research relating to the use of chemicals in controlling growth, and useful in the production, ripening, and handling of horticultural plants and products. Emphasis is placed on experimental procedures and the interpretation of results, current usage in the solution of horticultural problems, and the potentials for future research.

(Shanks.)

HORT 213. ENVIRONMENTAL FACTORS AND HORTICULTURAL PLANTS. (3)

First semester. Alternate years. Three lectures per week. Prerequisite, BOTN 101. A study of the literature and a discussion of current research concerned with the effects of environmental factors on the growth and fruiting of horticultural plants. Effects of temperature, light, and atmospheric conditions will be considered.

(Thompson.)

HORT 214. BREEDING OF HORTICULTURAL PLANTS. (3)

Second semester. Alternate years. Three lectures per week. Prerequisite, HORT 109 or permission of instructor. An advanced study of the genetic and cytogenetic basis of breeding and the techniques as applied to the improvement of specific horticultural plants.

(Angell.)

HORT 301. SPECIAL PROBLEMS IN HORTICULTURE. (1-3)

First or second semester. Credit according to time scheduled and organization of the course. The course may be organized as a lecture series on a specialized advanced topic or may consist of an experimental program other than the student's thesis problem. Maximum credit allowed toward an advanced degree shall not exceed 4 hours of experimental work plus any credit obtained in a specialized lecture series.

HORT 302. ADVANCED SEMINAR. (1, 1)

First and second semesters. Oral reports with illustrative material are required on special topics or recent research publications in horticulture. Three credit hours maximum allowed toward the M.S. degree or six credits maximum toward the Ph.D. degree. (Staff.)

HORT 399. ADVANCED HORTICULTURAL RESEARCH. (2-12)

First and second semesters. Credit granted according to work done. (Staff.)

EXPERIMENTAL PROCEDURES IN THE AGRICULTURAL SCIENCES

See Agriculture, AGRI 210.

(Haut, Scott.)

THE AGRICULTURAL EXPERIMENT STATION

IRVIN C. HAUT, PH.D., *Director*

The Agricultural Experiment Station serves Maryland agriculture in much the same manner as research laboratories serve large corporations. Maryland agriculture comprises over thirty thousand individual businesses, and there is neither sufficient capital, nor income so that each one of these can conduct research. Yet the problems which face a biological undertaking such as farming, are as numerous and perplexing as the problems of any business. Certainly our production of food would be much more costly if it were not for the research results that have been obtained by the Agricultural Experiment Station.

The station is a joint federal and state undertaking. Passage of the Hatch Act of 1887, which made available a grant in aid to each state for the purpose of establishing an agricultural experiment station, gave a great impetus to the development of research work in agriculture. This work was further encouraged by the passage of the Adams Act in 1906, the Purnell Act in 1925, the Bankhead-Jones Act in 1935, and the Flannagan-Hope Act of 1946.

The work of the Maryland Agricultural Experiment Station, which is supported by these Acts and by State appropriations, centers at College Park. On the University campus are laboratories for studying insects and diseases, soil fertility, botanical problems, and others. This is also the location of the livestock and dairy barns with their experimental herds. About eight miles from the campus at College Park, near Beltsville, the Plant Research Farm of about 500 acres is devoted to work connected with soil fertility, plant breeding and general crop production problems. An experimental farm near Upper Marlboro is devoted to the problems of tobacco growing and curing. A farm near Salisbury is devoted to solution of the problems of producers of broilers and of vegetable crops in the southern Eastern Shore area. Two experimental farms are operated near Ellicott City; one is devoted to livestock problems and the other to dairy cattle nutrition and forage research. Also tests of various crop and soil responses are distributed throughout the state. These different locations provide the opportunity to conduct experiments under conditions existing where the results will be put into practice. The solution of many difficult problems in the past has given the Station an excellent standing with farmers of the state.

AGRICULTURAL EXTENSION SERVICE

ROBERT E. WAGNER, *Director*

Cooperative Extension work in agriculture and home economics, established by state and federal laws in 1914, extends practical agricultural and home information beyond the classrooms of the University of Maryland to young people, farmers, homemakers, and people in businesses relating to agriculture and home economics.

The educational endeavors of the Cooperative Extension Service are financed cooperatively by the federal, state, and county governments. In each county there is a competent staff of Extension agents assigned to conduct educational work in rather specific program areas consistent with the needs of the people in the county and as funds permit. The county staff is supported by a staff of specialists located at the University, and through their mutual efforts they assist local people in seeking solutions to problems.

This work is conducted under a Memorandum of Understanding between the Cooperative Extension Service of the University and the United States Department of Agriculture. The Maryland Cooperative Extension Service functions as the educational arm of the United States Department of Agriculture and the University of Maryland.

The Cooperative Extension Service works in close harmony and association with all rural groups and organizations. In addition to the work on the farms and in the farm homes, the Extension program is aimed at the many rural, non-farm, and urban clientele who service the agricultural industries of the state including consumers.

In addition to work with adults, thousands of boys and girls gain leadership knowledge and experience and are provided practical educational instruction in 4-H Clubs and other youth groups. Through the many diversified activities, the boys and girls gain valuable experience from instruction and training and are afforded an opportunity to develop self-confidence, perseverance, and citizenship.

The Cooperative Extension Service in cooperation with the College of Agriculture and the Experiment Station arranges and conducts short courses, workshops, and conferences in various lines, many of which are held at the University. Some of these activities have been held regularly over a period of years and others are added as the need and demand develop. Short courses have been held in recent years for the following groups: rural women, 4-H Club boys and girls, nurserymen, florists, poultry industry fieldmen, poultry products marketing, beekeepers, greenkeepers, sanitarians, conservation, dairy herd improvement supervisors, feed manufacturers and distributors, and dairy marketing technicians.

SERVICE AND CONTROL PROGRAMS

CHARLES P. ELLINGTON, *Director*

The state law provides that the Board of Regents of the University of Maryland shall constitute the Maryland State Board of Agriculture. While the Service and Control programs are part of the University, they are designed

primarily to carry out the functions of the State Board of Agriculture. Numerous services are performed which result in the improvement and maintenance of high standards in production, processing and distribution of farm products. In addition, many control or regulatory activities are authorized by state law and are carried out by the following departments of the State Board of Agriculture:

DAIRY INSPECTION

The Maryland law relating to the weighing, sampling, and testing of milk became effective June 1, 1965.

The purposes of the law are: (a) To insure producers who sell milk that samples, weights, and tests used as the basis of payment for such products are correct; (b) To insure dealers who purchase milk and cream that their agents correctly weigh, sample, and test these products; (c) To insure correctness of tests made for official inspections or for public record. To achieve these purposes the law requires the licensing of all dealers who purchase milk and cream from producers, and the licensing of all persons sampling, weighing and testing milk and cream when the results serve as a basis of payment to producers.

Duties of the dairy inspection force deal with the calibration of glassware used in testing milk and cream; examination of all weighers, samplers, and testers and the issuance of licenses to those satisfactorily passing the examination; and inspection of the pertinent activities of weighers, samplers, testers and dairy plants.

DEPARTMENT OF MARKETS

Activities of the Department of Markets serve to insure a fair and equitable treatment of the farmer in all dealings which he may have concerning the marketing of his products. In the performance of these responsibilities, the Department conducts market surveys, compiles and disseminates marketing information and market data, operates a market news service, provides an agricultural inspection and grading service, maintains a consumer information service and enforces the agricultural marketing laws of the state. The control work of the department is carried out under the authority of various state laws relating to the marketing of farm products. A close working relationship is maintained with other specialists in the Extension Service, the Maryland Crop Reporting Service, and the Consumer and Marketing Service of the United States Department of Agriculture. The voluntary cooperation in these various activities brings to bear on agricultural marketing problems an effective combination of research, education and service.

The passage of the Federal Agricultural Research and Marketing Act gave additional impetus to the study and solution of agriculture's marketing problems. The Department of Markets is largely responsible for developing the state program under Title II of this act.

Information and assistance in all phases of marketing is available to all in-

terested persons. Marketing specialists hold meetings and demonstrations in local communities. Field offices are located in Baltimore, Salisbury, Hancock and Pocomoke.

MARYLAND LIVESTOCK SANITARY SERVICE

The Livestock Sanitary Service is charged with the responsibility of preventing the introduction of diseases of animals and poultry from outside of the state and with control and eradication of such diseases within the state. The Service cooperates with the State Department of Health in the suppression of diseases of animals and poultry which affect public health.

Control projects in tuberculosis, Johne's disease, hog cholera, brucellosis are conducted in cooperation with the Department of Agriculture. The field force of state employed veterinarians is augmented by a number of federal veterinarians in the conduct of these control programs. Programs designed to control rabies, pullorum in poultry, and many other disease conditions are also conducted by the Livestock Sanitary Service.

Facilities for the diagnosis of a wide variety of diseases are furnished in the main laboratory at College Park and in the branch laboratories at Salisbury, Preston, Centreville, Bel Air, Frederick and Oakland.

SEED INSPECTION

The Seed Inspection Service administers the state seed law; inspects seeds sold throughout the state; collects seed samples for laboratory examination; reports the results of the examinations to the parties concerned; publishes summaries of these reports which show the relative reliability of the label information supplied by wholesale seedsmen; cleans and treats tobacco seed intended for planting in the state; makes analyses, tests, and examinations of seed samples submitted to the laboratory; and advises seed users regarding the economic and intelligent use of seeds. The Service also cooperates with the Consumer and Marketing Service of the Department of Agriculture in the enforcement of the Federal Seed Act.

The work of the Seed Inspection Service is not restricted to the enforcement of the seed law however, for state citizens may submit seed samples to the laboratory for analysis, test or examination. Specific information regarding suitability for planting purposes of lots of seeds is thus made available to individuals without charge. The growth of this service has been steady since the establishment of the laboratory in 1912. Most Maryland citizens, urban and rural, are directly interested in seeds for planting in flower beds, lawns, gardens, or fields.

Seed certification is another responsibility of the State Board of Agriculture. Specialists working with farmers encourage the production of high quality, weed-free, seed of major crops grown in the State.

STATE HORTICULTURAL DEPARTMENT

In 1916 several sections of existing law were combined and re-enacted with such changes in the wording as were necessary to bring them into conformity

with the reorganization of the Maryland State College of Agriculture and Experiment Station and its Board of Trustees. Subsequently all regulatory functions including newly enacted Articles in regard to the bee diseases and mosquitoes were transferred to the State Board of Agriculture.

Work in this field is designed to control insects and plant diseases and to protect the public in the purchase of products of nurserymen and florists. A considerable part of the time of the staff is occupied by inspection of orchards, crops, nurseries, greenhouses, and floral establishments. Cooperation with the federal government in the inspection and certification of materials that come under quarantine regulations is another major function of the Department. The Department enforces the provisions of the Apiary Law, including inspection of apiaries. Other work of this Department includes control and eradication of diseases of strawberries and other small fruits, diseases of apples and peaches, inspection and certification of potatoes and sweet potatoes for seed, control of white pine blister rust, Dutch elm diseases, and oak wilt.

STATE DEPARTMENT OF DRAINAGE

The State Department of Drainage was established in 1937. Its duties are to encourage and assist with the drainage of agricultural lands in the state, to correlate the activities of the local drainage organizations in the state and to cooperate with state and federal agencies in the interest of a permanent program of improved drainage.

STATE INSPECTION SERVICE

Feeds, Fertilizer, Agricultural Liming Materials and Pesticides

The protection of consumers and manufacturers of agricultural products against fraudulent practices, makes certain specialized laws necessary. These are classified as correct labeling laws, and are enforced by the State Inspection Service. Included in this legislation are the Feed, Fertilizer, Agricultural Liming Materials, and Pesticide Laws.

Work of enforcing these laws is divided into five distinct phases: First, the commodities concerned must be registered under acceptable brand names, and with proper labels; second, official samples must be collected by inspectors from all parts of the state; third, chemical and physical examinations must be made to establish that professed standards of quality are being met; fourth, result must be assembled, published and made available to all interested persons; and fifth, the prosecution of those responsible for flagrant violations.

Hundreds of tests also are made annually on feed, fertilizer, and lime samples submitted by state purchasers. No charge is made for this service.

Throughout its existence, this Department has cooperated with comparable federal agencies in every possible way. In this activity it has attained not only state-wide, but also a nationally recognized reputation for accuracy, timeliness, and unbiased fair treatment of the consumer and manufacturer alike.

The facilities of the Department are at all times available to supply the manufacturer with technical advice, and to safeguard him from unfair competition.

SOIL CONSERVATION

In 1937 the Maryland Legislature established the State Soil Conservation Districts in Maryland. The twenty-four Districts that have been organized in Maryland include all the land in the state.

The State Committee is charged with the responsibility of coordinating the efforts of the District and encouraging the application of soil and water conservation practices.

The Committee receives applications for funds for watershed work under the Federal Watershed Protection and Flood Prevention Act (PL 566).

The 1968-1969 Faculty

Administrative Officers

BENTZ, Frank L., Jr., Vice President for Agricultural Affairs and Associate Professor of Soils

B.S., University of Maryland, 1942; Ph.D., 1952.

CAIRNS, Gordon M., Dean and Professor of Dairy Husbandry

B.S., Cornell University, 1936; M.S., 1938; Ph.D., 1940.

POFFENBERGER, Paul R., Assistant Dean-Instruction, and Professor of Agricultural Economics

B.S., University of Maryland, 1935; M.S., 1937; Ph.D., American University, 1953.

HAUT, Irvin C., Director of Experiment Station and Professor of Horticulture

B.S., University of Idaho, 1928; M.S., State College of Washington, 1930; Ph.D., University of Maryland, 1933.

WAGNER, Robert E., Director of Extension and Professor of Agronomy

B.S., Kansas State College, 1942; M.S., University of Wisconsin, 1943; Ph.D., University of Wisconsin, 1950.

ELLINGTON, Charles P., Director of Service and Control Programs and Extension Assistant Professor of Agronomy

B.S., University of Georgia, 1950; M.S., University of Maryland, 1952; Ph.D., Pennsylvania State University, 1964.

Faculty

ALBERT, Thomas F., Assistant Professor of Veterinary Science

B.S., Pennsylvania State University, 1959; V.M.D., University of Pennsylvania, 1962.

ANGELL, Frederick F., Assistant Professor of Vegetable Crops

B.S., Southern Illinois University, 1960; M.S., 1961; Ph.D., University of Wisconsin, 1965.

ANGUS, Richard R., Extension Assistant Professor and State Leader, 4-H and Youth

B.S., University of Minnesota, 1953; M.S., University of Minnesota, 1957.

ARBUCKLE, Wendell S., Professor of Dairy Science

B.S., Purdue University, 1933; A.M., University of Missouri, 1937; Ph.D., 1940.

AYCOCK, Marvin K., Jr., Assistant Professor of Agronomy

B.S., North Carolina State University, 1959; M.S., 1963; Ph.D., Iowa State University, 1966.

AXLEY, John H., Professor of Soils

B.A., University of Wisconsin, 1937; Ph.D., 1945.

BAILEY, Martin G., Extension Assistant Professor and Extension Supervisor, Agriculture

B.S., Hampton Institute, 1937; M.Ed., Cornell University, 1955.

BAKER, Robert L., Assistant Professor of Ornamental Horticulture

A.B., Swarthmore College, 1959; M.S., University of Maryland, 1962; Ph.D., 1965.

BAMFORD, Ronald, Professor of Botany

B.S., University of Connecticut, 1924; M.S., University of Vermont, 1926; Ph.D., Columbia University, 1931.

BANDEL, V. Allan, Assistant Professor of Soils

B.S., University of Maryland, 1959; M.S., 1962; Ph.D., 1965.

BEAL, George M., Professor of Agricultural Economics

B.S., Utah State College, 1934; M.S., University of Wisconsin, 1938; Ph.D., 1942.

BEAN, George A., Assistant Professor of Plant Pathology

B.S., Cornell University, 1958; M.S., University of Minnesota, 1960; Ph.D., 1963.

BEITER, Robert J., Instructor, Agricultural Economics

B.S., University of Maryland, 1952; M.S., 1957.

BENDER, Filmore E., Assistant Professor of Agricultural Economics

B.S., University of California, 1961; M.S., North Carolina State College, 1964; Ph.D., 1965.

BEZDICEK, David F., Assistant Professor of Soils

B.S., South Dakota State University, 1960; M.S., University of Minnesota, 1964; Ph.D., 1967.

BICKLEY, William E., Professor and Head of Entomology

B.S., University of Tennessee, 1934; M.S., 1936; Ph.D., University of Maryland, 1940.

BIGBEE, Daniel E., Assistant Professor of Poultry Science

B.S., Oklahoma State University, 1956; M.S., 1958; Ph.D., Michigan State University, 1962.

BRENNAN, Melvin C., Instructor, Visual Aids

B.S., University of Maryland, 1952.

BRICKER, A. June, Extension Professor and State Leader, Extension Home Economics

B.S., Battle Creek College, 1935; M.A., New York University, 1953; Ph.D., New York University, 1961.

BRODIE, Herbert L., Extension Instructor of Agricultural Engineering

B.S.A.E., Rutgers State University, 1964.

BROWN, Russell G., Associate Professor of Botany

B.S., West Virginia University, 1929; M.S., 1930; Ph.D., University of Maryland, 1934.

BUCKEL, W. Max, Extension Assistant Professor and Extension Supervisor, Agriculture

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University Calendar 1968-1969

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m.—Christmas recess ends
	14	Wednesday	After 1st class—end of instruction
	16-18	Thursday-Saturday	Fall Semester Examinations
	20	Monday	Inauguration Day, holiday
	21-24	Tuesday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
MARCH	29	Saturday	After last class—Spring recess begins
APRIL	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
	23-25	Monday-Wednesday	State Vocational Agriculture Teachers Conference
AUGUST	5-8	Tuesday-Friday	Maryland 4-H Conference
SEPTEMBER	2-5	Tuesday-Friday	Firemans Short Course

FALL SEMESTER, 1969—TENTATIVE

SEPTEMBER	8-12	Monday-Friday	Fall Semester Registration
	15	Monday	Instruction begins
NOVEMBER	26	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	1	Monday	8:00 a.m.—Thanksgiving recess ends
	19	Friday	After last class—Christmas recess begins

1970

TENTATIVE

JANUARY	5	Monday	8:00 a.m.—Christmas recess ends
	14	Wednesday	Pre-exam Study Day
	15-22	Thursday-Thursday	Fall Semester Examinations

SPRING SEMESTER, 1970—TENTATIVE

FEBRUARY	2-6	Monday-Friday	Spring Semester Registration
	9	Monday	Instruction begins
MARCH	26	Thursday	After last class—Spring recess begins
APRIL	6	Monday	8:00 a.m.—Spring recess ends
MAY	27	Wednesday	Pre-exam Study Day
	28-June	5 Thursday-Friday	Spring Semester Examinations
JUNE	6	Saturday	Commencement Exercises

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THE FUTURE OF THE UNIVERSITY



CHARLES MANNING, DEAN

The College

THE COLLEGE OF ARTS AND SCIENCES offers its students a liberal education. It seeks to develop graduates who can deal intelligently with the problems which confront them and whose general education will be a continuing source not only of material well-being but of genuine personal satisfaction. It also offers each student the opportunity to concentrate in the field of his choice; this element of depth serves both as an integral part of his education and as a foundation for further professional training or pursuits.

History

This College is an outgrowth of the Division of Language and Literature and the Division of Applied Science and the later School of Liberal Arts of Maryland State College. In 1921 the School of Liberal Arts and the School of Chemistry were combined and other physical and biological sciences were brought into the newly formed College of Arts and Sciences. In later reorganizations some departments have been added and some transferred to the administrative control of other colleges.

Application Information

FALL SEMESTER

All applications for full-time undergraduate admission for the fall semester at the College Park campus must be received by the University on or before June 1. Any student registering for nine or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. This means that the applicant's educational records, Scholastic Aptitude Test (SAT) scores (in the case of new freshmen) and medical examination report must be received by July 15.

SPRING SEMESTER

The deadline for the receipt of applications for the spring semester in 1969 is January 1.

UNIVERSITY COLLEGE

The application deadlines and fees *do not* apply to students registering in the evening classes offered by the University College.

GRADUATE SCHOOL

Application for admission to the Graduate School must be made by July 15 for the fall term and by December 15 for the spring term on blanks obtained from the Office of the Graduate School. Admission to the summer session is governed by the date listed in the Summer School catalog. The summer session deadline date is generally May 15.

Requirements for Admission

The requirements for admission to the College of Arts and Sciences are, in general, the same as those for admission to the other colleges and schools of the University. Application must be made to the Director of Admissions, University of Maryland, College Park, Maryland.

The student who intends to pursue a program of study in the College of Arts and Sciences should include the following subjects in his high school program: English, four units; college preparatory mathematics (algebra, plane geometry), three or four units; foreign language, two or more units; biology, chemistry, or physics, two units; history and social sciences, one or more units.

The student who wishes to major in chemistry, mathematics, physics, botany, microbiology, zoology, or who wishes to follow a pre-medical or pre-dental program, should include four units of college preparatory mathematics (algebra, plane geometry, trigonometry, and more advanced mathematics, if available). He should also include chemistry and physics.

Costs

Basic annual costs of attending the University in the Academic Year 1969-1970 for full-time undergraduate students on the College Park campus are as follows:

	<i>Maryland residents</i>	<i>Non-residents of Maryland</i>
Fixed charges	\$390.00	\$390.00
Special fees	116.00	116.00
Non-resident tuition		500.00
Board	540.00	540.00
Lodging	360.00	460.00

A fee of \$10.00 must accompany a prospective student's application for admission. If the student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. A \$50.00 deposit will be required within three weeks of the offer of admission.

Degrees

Students of this College who satisfactorily complete curricula with majors in departments of the humanities or social sciences are awarded the degree of Bachelor of Arts.* Those who satisfactorily complete curricula with majors

*The Departments of Economics, Geography, and Government and Politics, although administratively in the College of Business and Public Administration, offer courses for Arts and Sciences students. Majors may be elected in these departments as in those of the departments administered by the College of Arts and Sciences.

in the Department of Mathematics or the biological and physical sciences are awarded the degree of Bachelor of Science.* Those who complete satisfactorily a special professional program in the Department of Music are awarded the degree of Bachelor of Music.

Residence

The last thirty semester hours credit of any curriculum leading to a baccalaureate degree in the College of Arts and Sciences must be taken in residence in this University.

For Additional Information

Detailed information concerning admission, fees and expenses, scholarships and awards, student life, and other material of a general nature may be found in the University publication titled *An Adventure in Learning*. This publication may be obtained on request from the Catalog Mailing Office, North Administration Building, University of Maryland, College Park 20742. A detailed explanation of the regulations of student and academic life may be found in the University publication titled *University General and Academic Regulations*.

Requests for course catalogs for the individual schools and colleges should be directed to the deans of these respective units, addressed to:

COLLEGES LOCATED AT COLLEGE PARK:

Dean
(College in which you are interested)
University of Maryland
College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean
(School in which you are interested)
University of Maryland
Lombard and Greene Streets
Baltimore, Maryland 21201

*The Department of Botany, although administered by the College of Agriculture, offers courses for Arts and Sciences students. A major may be elected in this department as in those of the departments administered by the College of Arts and Sciences.

ACADEMIC INFORMATION

General Requirements for Degrees

The baccalaureate degree from the College of Arts and Sciences may be conferred upon a student who has satisfied the following requirements:

1. General Education requirements.
2. College of Arts and Sciences requirements.

General Education Requirements

A college education implies something more than an adequate technical training in the student's field of specialization. In order that each graduate with a Bachelor's degree may gain a liberal education as well as a specialized one, the University has established a General Education Requirement. This requirement consists of 34 semester hours of credit in six general fields. There is a wide choice in specific courses which may be used to satisfy requirements in all of the six fields except English. Physical Education and Health requirements for all students are taken in addition to this 34-hour group of courses.

1. The General Education courses are as follows:

In *English* (9 hours): ENGL 001—Composition, or ENGL 021—Honors Composition; ENGL 003 and 004—World Literature.

In *Fine Arts or Philosophy* (3 hours), three-credit courses in five departments are available, as follows: ART COURSES: 010—Introduction to Art; 060 or 061—History of Art; 065 or 066—Masterpieces of Painting; 067 or 068—Masterpieces of Sculpture; 070 or 071—Masterpieces of Architecture; 080 or 081—History of American Art. DANCE COURSES: 032—Introduction to Dance; 182 or 183—History of Dance; 184—Theory and Philosophy of Dance. MUSIC COURSE: 020—Survey of Music Literature. SPEECH COURSES: 016—Introduction to the Theatre; 114—The Film as an Art Form. PHILOSOPHY COURSES: 001—Introduction to Philosophy; 041—Elementary Logic and Semantics; 045—Ethics; 052—Philosophy in Literature; 053—Philosophy of Religion; 056—Philosophy of Science; 147—Philosophy of Art; 152—Philosophy of History; 154—Political and Social Philosophy.

In *History* (6 hours), the student is required to distribute his work between United States and non-United States fields, with three hours in each. Recommended courses in United States History are: 021—History of the United States to 1865; 022—History of the United States since 1865; 023—Social and Cultural History of Early America; 024—Social and Cultural History of Modern America; or 029—The United States in World Affairs. For the exceptionally well-prepared student, however, 100-level (junior or senior) courses which have no prerequisite are also available. In non-United States History, recommended courses are: 031 or 032—Latin American History; 041 or 042—Western Civilization; 051 or 052—The Humanities; 053 or 054—History of England and Great Britain; 061 or 062—Far Eastern Civilization; or 071 or 072—Islamic Civilization. Here also the well-prepared student may use non-prerequisite courses at the 100 level to satisfy the requirement.

In *Mathematics* (3 hours), any course carrying credit of three or more hours

for which the student is eligible will satisfy this University requirement. (Note, however, that some curricula require higher-numbered sequences than those for which the student is eligible at the time of his admission; while other sequences may be open *only* to students registered in specified curricula.) Students in science curricula will usually satisfy this requirement automatically.

In *Science* (7 hours), students are required to take one course in a physical science and one course in a biological science; one of these must be a laboratory (4-hour) course. The physical sciences for this purpose are Astronomy, Chemistry, Geology, and Physics; biological sciences are Botany, Entomology, and Zoology. Students whose curricula include seven or more hours of physical or biological science are not required to take additional courses to meet this distribution requirement. The non-science student may register for a basic course or any higher course for which he is eligible by placement, prerequisite, and class standing.

In *Social Science* (6 hours), two courses may be chosen from five fields: ANTH 001—Introduction to Anthropology; ECON 031—Principles of Economics, or ECON 037—Fundamentals of Economics; GVPT 001—American Government, GVPT 003—Principles of Government and Politics, or GVPT 101—International Relations; PSYC 001—Introduction to Psychology; or SOCY 001—Introduction to Sociology.

2. It should be emphasized that the 34 semester hours of General Education courses constitute a University requirement, applicable to all students receiving a Bachelor's degree from the University of Maryland. Individual Colleges within the University may add to, though they may not reduce, these requirements. For example, students in the College of Arts and Sciences pursuing a B.A. or B.S. degree are required to take a total of twelve hours of Mathematics and Science. Different curricula may specify one or more courses among the options. For example, students in the pre-medical program must offer PHIL 001 to satisfy the Fine Arts requirement.

3. In certain of the six fields, the student's level of placement (by examination or departmental evaluation) may modify the requirement. In History, students with unusually good high school preparation (as indicated by placement tests) may satisfy the requirement with two courses in the non-United States field, if they wish.

In general, appropriate Honors or pre-Honors courses may replace General Education courses, for eligible students. For example, students with high placement scores in English may substitute ENGL 021 (Honors Composition) for the ordinary requirement of ENGL 001. Honors and pre-Honors equivalents for General Education courses are specified in the several college catalogs.

4. The General Education Program is designed to be spread out over the four years of college. No General Education course requires credit in any prior college course as a prerequisite. Thus, a student may (within limits of his particular curriculum) satisfy a General Education requirement in each category with any designated course for which he is eligible by placement examination, department evaluation, and class standing. Most courses numbered 001 to 010 may be taken by freshmen; most courses between 011 and 099 require sophomore (or honors) standing. Courses at the 100 level are normally for juniors or seniors: that is, they require that a student have earned 56 hours

of college credit while in good academic standing. Exceptions are as explicitly stated in the catalogs of the several colleges.

SPECIAL NOTE FOR FOREIGN STUDENTS

The foreign student is required to take a special classification test in English before registering for the required English courses. He may be required to take FOLA 001 and 002—English for Foreign Students—*before* registering for ENGL 001.

PHYSICAL EDUCATION

All undergraduate men and women students who are registered for more than eight semester hours of credit are required to enroll in and successfully complete two prescribed courses in physical education for a total of two semester hours of credit. The successful completion of these courses is required for graduation. These courses must be taken by all eligible students during the first two semesters of attendance at the University, whether they intend to graduate or not. Men and women who have reached their thirtieth birthday are exempt from these courses. The thirtieth birthday must precede the Saturday of registration week. Students who are physically disqualified from taking these courses must enroll in adaptive courses for which credit will be given. A student who has 56 transferred academic credits will not be required to register for physical education. Students with military service may receive credit for these courses by applying to the Director of the Men's Physical Education Program. Students majoring or minoring in physical education, recreation, or health education may meet these requirements by enrolling in special professional courses.

HEALTH EDUCATION

All freshmen students are required to complete satisfactorily one semester of Health Education (HLTH 005) for graduation. Students who have reached their thirtieth birthday are exempt from this requirement.

College Requirements

1. FOREIGN LANGUAGE. Students in the College of Arts and Sciences must follow one of the following options in foreign language:

- a. They may take twelve semester hours in a classical language.
- b. Students who begin a modern foreign language in the University must successfully complete the study of that language in any authorized sequence, through Course 007 in all languages; however, Course 008 in German may be taken by science majors in lieu of 007.
- c. Students who continue in the University a language studied for two or more years in secondary school may choose, in French, German, or Spanish, between enrolling in Course 005 or taking a placement examination (students beginning in Courses 005, 006, or 007 must continue in any authorized sequence through Course 007). Students who score higher than the Course 007 level on the placement examination thereby fulfill the College language requirement. In modern languages other than French, German, or Spanish (i.e., languages

which do not have a Course 005), all students must take a placement examination.*

The languages which may be offered to meet this requirement are Chinese, French, German, Greek, Hebrew, Italian, Latin, Russian, and Spanish. Students who wish to offer a foreign language not included in this list should consult the chairman of the appropriate foreign language department for a recommendation to the Dean.

Foreign students may satisfy this requirement by offering twelve hours of English in addition to the regular English requirement. The special course in English for foreign students (FOLA 001, 002) may be included in the additional hours of English. (This option may not be used by pre-medical students). A foreign student may not meet the foreign language requirement by taking freshman or sophomore courses in his native language.

Normally a student shall not be permitted to repeat a foreign language course below Course 009 for credit if he has successfully completed a higher numbered course than the one he wishes to repeat. Credit (including elective credit) will be given for a language Course 001 only if credit has been earned in additional courses in the same language.

2. NATURAL SCIENCE AND MATHEMATICS. Twelve semester hours are required, except for candidates for the Bachelor of Music degree (who must satisfy the minimum General Education requirement, however). The science courses elected require the approval of the Dean; departments in which courses may be selected are the same as those listed under the General Education requirements (pp. 18-19).

3. SPEECH. Normally, students in the arts area take SPCH 001 (3 hours), while those in the science area take 007 (2 hours). In certain specialized programs other courses may be required. The foreign student should register for 003—Fundamentals of General American Speech—rather than for the speech course normally required in his curriculum.

4. MAJOR AND MINOR REQUIREMENTS. Specific descriptions of the departmental, inter-departmental, or pre-professional majors are found, in alphabetical order, along with the course offerings in the second section of this catalog. The general College regulations controlling majors (and minors) are as follows.**

Each student chooses a field of concentration (major). He may make this choice as early as he wishes; however, once he has earned 56 hours of acceptable credit he *must* choose a major before his next registration.

In the program leading to the B.A. degree, the student must also have a secondary field of concentration (minor). The courses constituting the major and the minor must conform to the requirements of the department in which the major work is done.

*A placement test is given during registration week for students wishing to pursue a modern language they have studied in high school.

**Beginning September 1, 1968, the minor requirement for programs leading to the B.A. degree will be eliminated. Major departments may then require that specific supporting courses in other departments be included, along with required courses in the major department, in the area of concentration. Students enrolled in the University prior to September 1968 may elect to satisfy the requirements for programs leading to the B.A. degree either with the old plan or with the new.

The student must have an average of not less than "C" in the introductory courses in the field in which he intends to major.

A major shall consist, in addition to the underclass departmental requirements, of 24-40 hours, of which at least twelve must be in courses numbered 100 or above, and at least twelve of which must be taken in the University of Maryland.

A minor in programs leading to the B.A. degree shall consist of a coherent group of courses totaling 18 semester hours in addition to the requirements listed above. At least six of the 18 hours must be in a single department in courses numbered 100 or above. The courses comprising the minor must be chosen with the approval of the major department. Except in certain specialized curricula approved by the Dean, not more than nine hours of the minor may be taken in courses outside of the College of Arts and Sciences.

No minor is required in programs leading to the B.S. degree, but the student must take supporting courses in science or other fields as specified by his major department.

The average grade of the work taken for the major must be at least "C"; some departments will count toward satisfaction of the major requirement no course completed with a grade of less than "C." The average grade of the work taken in the major and minor combined must be at least "C." A general average of "C" in courses taken at the University of Maryland is required for graduation.

Courses taken to fulfill the requirements in General Education may not be used toward major or minor requirements.

Junior Requirements

To attain junior standing, a student must acquire a minimum of 56 academic semester hours and be eligible to re-register in the University. See *University General and Academic Regulations* for full statement of rules pertaining to junior standing.

Normal Load

A minimum of 120 semester hours credit, exclusive of required courses in physical activities and health, is required for graduation. The normal load for students in this college is 15 semester hours credit per semester, exclusive of the required work in physical activities and health.

A student must have the approval of his adviser and dean to take more than the normal program perscribed in his curriculum.

Advisers

Each freshman in this College will be assigned to a faculty adviser who will help the student, during his first year, to select his courses and to determine what his field of major concentration should be.

The student at the sophomore level and above will be advised by a faculty member in his major department. Students following the three-year programs in Dentistry, Law, and Medicine will be advised by special advisers for these programs.

Electives in Other Schools and Colleges

A limited number of courses taken in other colleges and schools of the University may be counted for elective or minor credit toward a degree in the College of Arts and Sciences. The number of credits which may be accepted from the various colleges and schools is as follows: College of Education—24; all other colleges or independent departments—20. The combined credits from other colleges and schools shall not exceed 20 (or 24 if courses in education are included). For the combined degree programs in Dentistry, Law, or Medicine the first year of professional work must be completed and the student is permitted to continue immediately as a sophomore in the professional school.

Air Science

The Department of Air Science offers two all-voluntary programs in Air Force ROTC at the University of Maryland. Successful completion of either the 2-year or the 4-year program qualifies a student for a commission in the United States Air Force upon graduation. No Air Science course under the 100 level may be included in the 120 hours required for graduation.

Selected students who wish to do so may, with proper approval, carry Advanced Air Science courses as electives during their junior and senior years. Financial assistance is provided for students in the Advanced program. Specific information on either the two-year or the four-year program is included in the *University General and Academic Regulations*.

Certification of High School Teachers

If courses are properly chosen in the field of education, a prospective high school teacher can prepare for high school positions, with a major and minor in one of the departments of this College. A student who wishes to work for a teacher's certificate must consult his adviser before his junior year. Such a student must, at the same time, consult an adviser in the appropriate curriculum in the College of Education.

Honors

The aim of the College Honors Programs is to recognize and encourage superior scholarship. To this end, Honors work offers the gifted student challenging opportunities to work in small groups with carefully chosen instructors and to move at a speed appropriate to his capacities in an atmosphere conducive both to independent study and to growth in intellectual maturity. The College conducts both General and Departmental Honors Programs spanning the four undergraduate years. For information concerning the General Honors Program, see below, under "Honors."

For information concerning the Departmental Honors Programs, consult the various departmental entries in this catalog. It may, however, be remarked that the Departmental Honors Programs are administered by a Honors Committee within each department. Admission to a Departmental Honors Program ordinarily occurs at the beginning of the first or second semester of the student's junior year. As a rule, only students with a cumulative grade point average of at least 3.0 are admitted. A comprehensive examination over the field of his

major program is given to a candidate near the end of his senior year. On the basis of the student's performance on the Honors Comprehensive Examination and in meeting such other requirements as may be set by the Departmental Honors Committee, the faculty may vote to recommend the candidate for the appropriate degree with (departmental) HONORS, or for the appropriate degree with (departmental) HIGH HONORS. Successful candidacy will be symbolized by appropriate announcement in the Commencement Program and by citation on the student's academic record and diploma.

Students in the General and Departmental Honors Programs enjoy some academic privileges similar to those of graduate students.



Programs and Course Offerings

COURSES NUMBERED FROM 001 TO 099 are open to undergraduate students who meet the stated prerequisite and curriculum requirements.

Courses numbered from 100 to 199 are open to juniors and seniors with the stated prerequisites. Under some conditions, second-semester sophomores may register for 100-level courses with the Dean's approval. Graduate students may take 100-level courses for credit, subject to departmental and Graduate School regulations.

Courses numbered 200 and above are for graduate students only, except in exceptional cases approved by the Dean of Arts and Sciences and the Dean of the Graduate School.

AMERICAN STUDIES

Committee on American Studies: Beall (*Chairman*), Lounsbury, and members from cooperating departments.

The University has a comprehensive program in American Studies. It begins with required courses on the freshman and sophomore levels, includes a major for juniors and seniors, and also provides for graduate work on the M.A. and Ph.D. levels. (For information concerning the graduate program, see the Graduate School Catalog.)

The student who majors in American Studies has the advantage of being taught by specialists from various departments. The committee in charge of the program represents the Department of English, History, Art, and Philosophy.

The program is intended to have generous breadth, but the danger of securing breadth without depth is offset by the requirement of an area of concentration. Strong emphasis upon English and History is required, with a concentration in one of these. The major consists of 42 credits (of which 24 must be on the 100 level) including not only courses in American Studies but additional courses distributed among the four fields of English, History, Art, and Philosophy. Since the major is a special interdisciplinary one, the student's selection of courses must meet the approval of the adviser. Two courses are required for the major: AMST 127, 128 (Culture and the Arts in America), 6 credits, for juniors; and AMST 137, 138 (Readings in American Studies), 6 credits, for seniors. No grade of less than C counts toward the major.

Suggested sample curriculum for American Studies majors: Junior year: AMST 127, AMST 128—Culture and the Arts in America (3, 3); ENGL 150 and ENGL 151—American Literature (3, 3); HIST 109 and HIST 110—Social History of the United States (3, 3); ART 080—History of American Art (3), (or ART 061—History of Art (3)); PHIL 102—Modern Philosophy (3); (or PHIL 101—Ancient Philosophy (3)); Electives (6).

Senior year: AMST 137 and 138—Readings in American Studies (3, 3); ENGL 155 and 156—Major American Writers (3, 3); HIST 133 and 134—History of Ideas in America (3, 3); ART 178—20th Century Art (3); PHIL 105—Philosophy in America (3); Electives (6).

Freshmen who are interested in this program should consult with their lower division adviser. Upperclassmen should consult with Professor Lounsbury.

AMST 127, 128. CULTURE AND THE ARTS IN AMERICA. (3, 3)

Prerequisite, junior standing. A study of American institutions, the intellectual and esthetic climate from the Colonial period to the present. (Beall)

AMST 137, 138. READINGS IN AMERICAN STUDIES. (3, 3)

First and second semesters. A historical survey of American values as presented in various key writings. (Lounsbury)

For Graduates

AMST 200. INTRODUCTORY SEMINAR IN AMERICAN STUDIES. (3)

(Lounsbury)

AMST 201, 202. SEMINAR IN AMERICAN STUDIES. (3, 3)

(Beall, Vitzthum)

AMST 251. ORIENTATION SEMINAR—MATERIAL ASPECTS OF AMERICAN CIVILIZATION. (3)

Class meets at the Smithsonian Institution.

(Staff)

AMST 255, 256. READING COURSE IN SELECTED ASPECTS OF AMERICAN CIVILIZATION. (3, 3)

Class meets at the Smithsonian Institution.

(Staff)

AMST 299. THESIS RESEARCH. (1-6)

Class meets at the Smithsonian Institution.

(Staff)

AMST 399. THESIS RESEARCH. (1-6)

(Staff)

ANTHROPOLOGY (Division of Sociology)

Associate Professor and Director of the Division of Anthropology: WILLIAMS.

Associate Professors: ANDERSON AND HOFFMAN.

Lecturers: HULSE AND WILMSEN (P.T.).

The Division of Anthropology offers beginning and advanced course work in the four principal subdivisions of the discipline: physical anthropology, linguistics, archaeology, and ethnology. Courses in these subdivisions may be used to fulfill the minor or "supporting courses" requirement in some programs leading to the B.A. degree. They also may, at the discretion of the Department of Sociology, be counted toward a major in Sociology.

Anthropology Major: The fulfillment of the requirements for a major in anthropology leads to the B.A. degree. All majors are required to take 30 hours in anthropology, 18 of which must be selected from the following courses: ANTH 001, 002, 101, 141 or 151, 161 or 171, and 198. It should be noted, however, that if ANTH 001 is used to satisfy the General Education requirement in Social Science, it may not be counted as a part of the 30 required semester hours for the major. The 18 hours of required courses insures that the major becomes familiar with all areas of anthropology. No one area, therefore, receives special emphasis, for it is believed that such specialization should occur during graduate study, preferably at the Ph.D. level. Thus the

student is broadly prepared in the ways man has evolved culturally and physically. A statement of course requirements and recommended sequences of courses is available in the departmental office.

No course with a grade of less than "C" may be used to satisfy major requirements.

ANTH 001 or its equivalent is prerequisite to all other courses in Anthropology.

ANTH 001. INTRODUCTION TO ANTHROPOLOGY: ARCHEOLOGY AND PHYSICAL ANTHROPOLOGY. (3)

May be taken for credit in the General Education Program. General patterns of the development of human culture; the biological and morphological aspects of man viewed in his cultural setting. (Staff)

ANTH 002. INTRODUCTION TO ANTHROPOLOGY: CULTURAL ANTHROPOLOGY AND LINGUISTICS. (3)

Social and cultural principles as exemplified in ethnographic descriptions. The study of language within the context of Anthropology. (Staff)

ANTH 021. MAN AND ENVIRONMENT. (3)

Prerequisite, sophomore standing. A geographical introduction to ethnology, emphasizing the relations between cultural forms and natural environment. (Anderson)

ANTH 041. INTRODUCTION TO ARCHEOLOGY. (3)

Prerequisite, sophomore standing. A survey of the basic aims and methods of archeological field work and interpretation, with emphasis on the reconstruction of prehistoric ways of life. (Staff)

ANTH 061. INTRODUCTION TO PHYSICAL ANTHROPOLOGY. (3)

Prerequisite, sophomore standing. The biological evolution of man, including the process of race formation, as revealed by the study of the fossil record and observation of modern forms. (Staff)

ANTH 071. LANGUAGE AND CULTURE. (3)

Prerequisite, sophomore standing. A non-technical introduction to linguistics, with special consideration of the relations between language and other aspects of culture. (Listed also as LING 071.) (Staff)

For Advanced Undergraduates and Graduates

ANTH 101. CULTURAL ANTHROPOLOGY: PRINCIPLES AND PROCESSES. (3)

Prerequisite, ANTH 001 or 002 or 021. An examination of the nature of human culture and its processes, both historical and functional. The approach will be topical and theoretical rather than descriptive.

(Anderson, Hoffman, Hulse, Williams)

ANTH 102. CULTURAL ANTHROPOLOGY: WORLD ETHNOGRAPHY. (3)

Prerequisite, ANTH 001 or 002 or 021. A descriptive survey of the culture areas of the world through an examination of the ways of selected representative societies. (Anderson, Hoffman, Hulse, Williams)

ANTH 114. ETHNOLOGY OF AFRICA. (3)

Prerequisites, ANTH 001 and 002. The native peoples and cultures of Africa and their historical relationships, with emphasis on that portion of the continent south of the Sahara. (Staff)

ANTH 123. ETHNOLOGY OF THE SOUTHWEST. (3)

Prerequisites, ANTH 001 and 002. Culture history, economic and social institutions, religion, and mythology of the Indians of the southwestern United States. (Anderson, Williams)

ANTH 124. ETHNOLOGY OF NORTH AMERICA. (3)

Prerequisites, ANTH 001 and 002. The native peoples and cultures of North America north of Mexico and their historical relationships, including the effects of contact with European-derived populations. (Hoffman)

ANTH 126. ETHNOLOGY OF MIDDLE AMERICA. (3)

Prerequisites, ANTH 001 and 002. Cultural background and modern social, economic and religious life of Indian and metiszo groups in Mexico and Central America; processes of acculturation and currents in cultural development. (Williams)

ANTH 131. SOCIAL ORGANIZATION OF PRIMITIVE PEOPLES. (3)

Prerequisites, ANTH 001 and 002. A comparative survey of the structures of non-literate and folk societies, covering both general principles and special regional developments. (Staff)

ANTH 134. RELIGION OF PRIMITIVE PEOPLES. (3)

Prerequisites, ANTH 001 and 002. A survey of the religious systems of primitive and folk societies, with emphasis on the relation of religion to other aspects of culture. (Anderson)

ANTH 141. ARCHEOLOGY OF THE OLD WORLD. (3)

Prerequisite, ANTH 001 or 041. A survey of the archeological materials of Europe, Asia and Africa, with emphasis on chronological and regional inter-relationships. (Staff)

ANTH 151. ARCHEOLOGY OF THE NEW WORLD. (3)

Prerequisite, ANTH 001 or 041. A survey of the archeological materials of North and South America, with emphasis on chronological and regional inter-relationships. (Williams)

ANTH 161. ADVANCED PHYSICAL ANTHROPOLOGY. (3)

Prerequisite, ANTH 001 or 061. A technical introduction to the hereditary, morphological, physiological, and behavioral characteristics of man and his primate ancestors and relatives, with emphasis on evolutionary processes. (Staff)

ANTH 171. INTRODUCTION TO LINGUISTICS. (3)

Introduction to the basic concepts of modern descriptive linguistics. Phonology, morphology, syntax. Examinations of the methods of comparative linguistics, internal reconstruction, dialect geography. (Listed also as LING 101 and ENGL 105.) (Tuniks)

ANTH 191. RESEARCH PROBLEMS. (3)

Prerequisite, permission of instructor. Introductory training in anthropological research methods. The student will prepare a paper embodying the results of an appropriate combination of research techniques applied to a selected problem in any field of anthropology. (Staff)

ANTH 198. ANTHROPOLOGICAL THEORY. (3)

Prerequisite, permission of instructor. A survey of the historical development and current emphasis in the theoretical approaches of all fields of anthropology, providing an integrated frame of reference for the discipline as a whole. (Williams)

ANTH 205. THEORY OF CULTURAL ANTHROPOLOGY. (3)

History and current trends of cultural anthropological theory, as a basic orientation for graduate studies and research. (Hoffman)

ANTH 281. PROCESSES OF CULTURE CHANGE. (3)

Change in culture due to contact, diffusion, innovation, fusion, integration and cultural evolution. (Williams)

ANTH 285. PEASANT COMMUNITIES IN THE MODERN WORLD. (3)

Comparative analysis of peasant communities in Latin America, Europe, Middle East, Asia and Africa. (Williams)

ANTH 287. CURRENT DEVELOPMENTS IN ANTHROPOLOGY. (3)

Detailed investigation of a current problem or research technique, the topic to be chosen in accordance with faculty interests and student needs. May be repeated, as content varies, for a total of not more than nine semester hours. (Staff)

ANTH 291. SPECIAL PROBLEMS IN ANTHROPOLOGY. (1-6)

Individual research on selected problems in any field of anthropology. (Staff)

ANTH 399. THESIS RESEARCH. (1-6)

(Staff)

ART

Professor and Chairman: LEVITINE.

Professors: LEMBACH AND MARIL.

Associate Professors: A. DE LEIRIS, GERDTS, GROSS, JAMIESON, LYNCH, O'CONNELL, STITES.

Assistant Professors: DENNY, FREENY, GROSSMAN, LONGLEY, O'CONNOR.

Instructors: BUNTS, CRULL, M. DE LEIRIS, DILLINGER, FORBES, GATHMAN, GELLMAN, HAYUM, ISEN, LEWIS, PEMBERTON.

Two majors are offered in Art: Art History and Studio. The student who majors in Art History is committed to the study and scholarly interpretation of existing works of art, from the prehistoric era to our times, while the studio major stresses the student's direct participation in the creation of works of art.

In spite of this difference, both majors are rooted in the concept of art as a humanistic experience, and share an essential common aim: the development of aesthetic sensitivity, understanding, and knowledge. For this reason, students in both majors are required to progress through a "common curriculum," which will ensure a broad grounding in both aspects of art; then each student will move into a "specialized curriculum" with advanced courses in his own major. Maximum allowable credits in either major is 42.

COMMON CURRICULUM:

ART 010, Introduction to Art (3); ART 012, Design I (3); ART 016, Drawing I (3); and ART 060 and 061, History of Art (3, 3).

SPECIALIZED CURRICULUM:

Art History major: ART 080, History of American Art (3); four courses in over 100 level in History of Art (12). In addition, one advanced course in Studio work is required. Total credits for Art History major: 33.

Studio major: ART 017, Painting I (3); ART 026, Drawing II (3); ART 118, Sculpture I (3); ART 119, Printmaking I (3); ART 126, Drawing III (3); plus one course at the 100 level (3). In addition, one advanced course in Art History is required. Total credits for Studio majors: 36.

No course with a grade less than "C" may be used to satisfy major requirements.

ART 010. INTRODUCTION TO ART. (3)

Basic tools of understanding visual art. This course stresses major approaches such as techniques, subject matter, form, and evaluation. Architecture, sculpture, painting, and graphic arts will be discussed. Required of all Art majors in the first year. (Staff)

ART 012. DESIGN I. (3)

Six hours per week. Prerequisite or concurrent registration, ART 010. Principles and elements of design including basic composition, line, color theory, perspective, and three-dimensional space. (Staff)

ART 016. DRAWING I. (3)

Six hours per week. Prerequisite or concurrent registration, ART 010. An introductory course with a variety of media and related techniques. Problems based on still life, figure, and nature. (Staff)

ART 017. PAINTING I. (3)

Six hours per week. Prerequisites, ART 010, 012, 016. Basic tools and language of painting. Oil and watercolor. (Maril, Staff)

ART 026. DRAWING II. (3)

Six hours per week. Prerequisites, ART 010, 012, 016. Original compositions from the figure and nature, supplemented by problems of personal and expressive drawing. (Staff)

ART 027. ARCHITECTURAL PRESENTATION. (3)

Six hours per week. Prerequisites, ART 010, 012, 016. Technique of wash and watercolor in architectural, interior, and landscape architectural rendering. (Stites)

ART 040. FUNDAMENTALS OF ART EDUCATION. (3)

Two hours of laboratory and two hours of lecture per week. Fundamental principles of the visual arts for teaching on the elementary level. Elements and principles of design and theory of color. Studio practice in different media. (Crull, Lewis, Lembach, Longley)

ART 060, 061. HISTORY OF ART. (3, 3)

A survey of western art as expressed through architecture, sculpture, and painting. First semester, prehistoric times to Renaissance; second semester, from Renaissance to the present. (Staff)

ART 065, 066. MASTERPIECES OF PAINTING. (3, 3)

Prerequisite, Sophomore standing. A study of the contributions of a few major painters, ranging from Giotto to Picasso. (Levitine, Staff)

ART 067, 068. MASTERPIECES OF SCULPTURE. (3, 3)

Prerequisite, Sophomore standing. A study of the contributions of a few major sculptors, ranging from Polykleitos to Moore. (Levitine, Staff)

ART 070, 071. MASTERPIECES OF ARCHITECTURE. (3, 3)

Prerequisite, Sophomore standing. A study of great architecture from Stonehenge to Dulles Airport. (Stites)

ART 080, 081. HISTORY OF AMERICAN ART. (3, 3)

Architecture, sculpture and painting in the United States from the Colonial period to the present. (Gerdtz)

ART 117. PAINTING II. (3)

Six hours per week. Prerequisites, ART 017, 026. Original compositions based upon nature, figure, and still life, supplemented by expressive painting. Choice of media. Different sections of course may be taken for credit.

117-a. Oil painting and related media. (Maril)

117-b. Watercolor and casein. (Grossman)

117-c. Plastic media, such as encaustic and polymer tempera. (Jamieson)

117-d. Mural painting. The use of contemporary synthetic media. (Jamieson)

ART 118. SCULPTURE I. (3)

Six hours per week. Prerequisite, ART 026. (For students majoring in Art History, by permission of Department.) Volumes, masses, and planes, based on the use of plastic earths. Simple armature construction and methods of casting. (Freeny)

ART 119. PRINTMAKING I. (3)

Six hours per week. Prerequisite, ART 026. (For students majoring in Art History, by permission of Department.) Basic printmaking technique in relief, intaglio, and planographic media. (Forbes)

ART 126. DRAWING III. (3)

Six hours per week. Prerequisite, ART 026. Emphasis on understanding organic form, as it is related to study from the human figure and to pictorial composition. (Isen, Jamieson)

ART 127. PAINTING III. (3)

Six hours per week. Prerequisite, ART 117. Creative painting for advanced students. Problems require a knowledge of pictorial structure. Development of personal direction. Choice of media. (Gross)

ART 128. SCULPTURE II. (3)

Six hours per week. Prerequisite, ART 118. Different sections of course may be taken in for credit.

128-a. Nature as a point of reference with potentiality of developing ideas into organic and architectural forms. (Freeny)

128-b. May be taken after 128-a. Problems involving plastic earths and other material capable of being modeled or cast. Choice of individual style encouraged. (Freeny)

ART 129. PRINTMAKING II. (3)

Six hours per week. Prerequisite, ART 119. One print media including extensive study of color processes. Individually structured problems. (O'Connell)

ART 137. PAINTING IV. (3)

Six hours per week. Prerequisite, ART 127. Creative painting. Emphasis on personal direction and self-criticism. Group seminars.

(Gross, Grossman, Jamieson, Maril)

ART 138. SCULPTURE III. (3)

Six hours per week. Prerequisite, ART 128. Problems and techniques of newer concepts, utilizing various materials, such as plastics and metals. Technical aspects of welding stressed. (Freeny)

ART 139. PRINTMAKING III. (3)

Six hours per week. Prerequisite, ART 129.

139-a. Contemporary experimental techniques of one print medium with group discussions. (O'Connell)

139-b. Continuation of 139-a. May be taken for credit after 139-a. (O'Connell)

ART 150, 151. SPANISH ART. (3, 3)

Special emphasis will be given to the artists of the 16th and 17th centuries, such as El Greco and Velasquez. (Lynch)

ART 152, 153. LATIN AMERICAN ART. (3, 3)

Art from the pre-Columbian civilization to the modern period. (Lynch)

ART 155. AMERICAN COLONIAL PAINTING. (3)

Development and style of painting in Colonial America: sources, genres, influential studios, Anglo-American School of historical painting. (Gerds)

ART 157. AMERICAN ART AND ITS RELATIONSHIP TO EUROPE: 1800-1900. (3)

ART 080 and 081 recommended. The American artist in Europe; American and German Romanticism; Neo-Classicism in America and Europe; Dusseldorf School; Munich School; Pre-Raphaelism; Barbizon School and Impressionism. (Gerds)

ART 160, 161. CLASSICAL ART. (3, 3)

Architecture, sculpture and painting in the Classical cultures. First semester will stress Greece; second semester, Rome. (Pemberton)

ART 162, 163. ART OF THE EAST. (3, 3)

Architecture, sculpture and painting. First semester will stress India; second semester, China and Japan. (Staff)

ART 164. EARLY CHRISTIAN AND BYZANTINE ART. (3)

Architecture, sculpture, painting, and mosaic of early Christian Rome, the Near East, and the Byzantine Empire. (Staff)

ART 166, 167. MEDIEVAL ART. (3, 3)

Architecture, sculpture and painting in the Middle Ages. First semester will stress Romanesque; second semester, the Gothic period. (Denny)

ART 168, 169. RENAISSANCE ART IN ITALY. (3, 3)

Architecture, sculpture and painting from 1400 to the High Renaissance in the 16th century. (Hayum)

ART 170. NORTHERN EUROPEAN PAINTING IN THE 15TH AND 16TH CENTURIES. (3)

Painting in Flanders and related northern European areas, from Van Eyck to Brueghel and Durer. (Denny)

ART 172, 173. EUROPEAN BAROQUE ART. (3, 3)

Architecture, sculpture and painting of the major European centers in the 17th century. (de Leiris)

ART 174, 175. FRENCH PAINTING. (3, 3)

French painting from the 15th through the 18th century, from Fouquet to David. (Levitine)

ART 176, 177. 19TH CENTURY EUROPEAN ART. (3, 3)

Architecture, sculpture and painting in European Art from Neo-Classicism to Impressionism. (de Leiris)

ART 178, 179. 20TH CENTURY ART. (3, 3)

Architecture, sculpture and painting from the late 19th century to our day.

(O'Connor)

ART 180. IMPRESSIONISM AND NEO-IMPRESSIONISM. (3)

Prerequisite, ART 060 and 061 or consent of instructor. History of Impressionism and Neo-Impressionism: artists, styles, art theories, criticism, sources, and influence on twentieth century.

(de Leiris)

ART 182. TWENTIETH CENTURY MASTERS AND MOVEMENTS. (3)

Artists and tendencies in twentieth century art. Subject will change and be announced each time course is offered.

(O'Connor)

ART 184. HISTORY OF THE GRAPHIC ARTS. (3)

Prerequisite, ART 010, or ART 069 and 061, or consent of instructor. Graphic techniques and styles in Europe from 1400 to 1800; contributions of major artists.

(Levitine)

ART 192, 193. DIRECTED STUDIES IN STUDIO ART. (2 or 3, 2 or 3)

For advanced students, by permission of Department Chairman. Course may be repeated for credit if content differs.

(Staff)

ART 194, 195. DIRECTED STUDIES IN ART HISTORY. (2 or 3, 2 or 3)

For advanced students, by permission of Department Chairman. Course may be repeated for credit if content differs.

(Staff)

For Graduates

The requirements of students will determine which courses will be offered.

ART 200, 201. PAINTING. (3, 3)

Specific projects to be developed. Conferences arranged.

(Grossman, Jamieson, Maril)

ART 202, 203. PAINTING. (3, 3)

Individual projects growing in complexity. Seminars.

(Grossman, Jamieson, Maril)

ART 211. PRINTMAKING. (3)

Advanced problems. Relief process.

(O'Connell)

ART 212. PRINTMAKING. (3)

Advanced problems. Intaglio process.

(O'Connell)

ART 213. PRINTMAKING. (3)

Advanced problems. Lithographic process.

(O'Connell)

ART 214. SEMINAR IN PRINTMAKING. (3)

(O'Connell)

ART 221, 222. EXPERIMENTATION IN SCULPTURE. (3, 3)

Independent research stressed.

(Freeny)

ART 223. MATERIALS AND TECHNIQUES IN SCULPTURE. (3)

For advanced students. Methods of armature building, casting, and the use of a variety of stone, wood, metal, and plastic materials.

(Freeny)

ART 224. SCULPTURE—CASTING AND FOUNDRY. (3)

The traditional methods of plaster casting and the more complicated types involving metal. *Cire perdue*, sandcasting and newer methods such as cold metal process.

(Freeny)

ART 226. DRAWING. (3)

Sustained treatment of a theme chosen by student. Wide variety of media.
(Jamieson)

ART 227. DRAWING. (3)

Traditional materials and methods including Oriental, Sumi ink drawing and techniques of Classical European masters.
(Jamieson)

ART 228. DRAWING. (3)

Detailed anatomical study of the human figure and preparation of large scale mural compositions.
(Jamieson)

ART 229. DRAWING AND PAINTING. (3)

Preparation and execution of a wall decoration.
(Jamieson)

ART 240, 241. ADVANCED PROBLEMS IN ART EDUCATION. (3, 3)

An integrated series of problems determined by the student's professional needs.
(Lembach)

ART 250. AMERICAN COLONIAL ART. (3)

The arts during the exploration period and Colonial development.
(Gerdtz)

ART 255. SEMINAR IN 19TH CENTURY AMERICAN ART. (3)

Problems in architecture, sculpture and painting from the end of the Colonial period until 1860.
(Gerdtz)

ART 256. TWENTIETH CENTURY AMERICAN ART. (3)

Prerequisite, ART 178 and 179 or equivalent. The "Eight," the Armory Show, American Abstraction, Romantic-Realism, New Deal Art projects, American Surrealism and Expressionism.
(O'Connor)

ART 257. SEMINAR IN AMERICAN ART AND ITS LITERARY SOURCES. (3)

Prerequisite, ART 080 and 081 or equivalent. Art and literature in the 19th century; literary influences on 19th century American painting; artistic and literary parallels; art theories and criticism by authors and artists.
(Gerdtz)

ART 258. SEMINAR IN LOCAL AND REGIONAL ART. (3)

Prerequisite, ART 080 and 081 or equivalent. Art in Washington, D. C., Baltimore and the State of Maryland. Major genres; prominent artists; public commissions; institutions.
(Gerdtz)

ART 259. THE ART OF MANNERISM. (3)

Prerequisite, ART 169 or permission of instructor. Mannerism in Europe during the 16th century; beginnings in Italy; ramifications in France, Germany, Flanders, Spain; painting, architecture and sculpture.
(Lynch)

ART 260. FRENCH PAINTING FROM LEBRUN TO GERICAULT, 1715-1815. (3)

Development of iconography and style from the Baroque to Neo-Classicism and Romanticism. Trends and major artists.
(Levitine)

ART 261. SEMINAR IN ROMANTICISM. (3)

Problems derived from the development of Romantic Art during the 18th and 19th centuries.
(Levitine)

ART 262. SEMINAR IN 18TH CENTURY EUROPEAN ART. (3)

(Levitine)

ART 263. SEMINAR IN 19TH CENTURY EUROPEAN ART. (3)

Problems derived from the period starting with David and ending with Cezanne.
(de Leiris)

ART 264. NINETEENTH CENTURY REALISM, 1830-1860. (3)

Prerequisite, ART 176 or 177 or equivalent. Courbet and the problem of Realism; precursors, David, Gericault, Landscape schools; Manet; artistic and social theories; Realism outside France. (de Leiris)

ART 265. SEMINAR IN POST-IMPRESSIONISM AND SYMBOLISM. (3)

Prerequisite, ART 176 or 177 or equivalent. The period of 1880-1900; Cezanne, van Gogh, Gauguin, the Nabis; Symbolism and Art Nouveau; social and aesthetic theories; formal and functional approaches to architecture. (de Leiris)

ART 266. SEMINAR IN CONTEMPORARY ART. (3)

Problems of Western art from 1900 to the present. (O'Connor)

ART 267. TWENTIETH CENTURY EUROPEAN ART. (3)

Prerequisite, ART 178 and 179 or equivalent. A detailed examination of the art of an individual country in the twentieth century: France, Germany, Italy, Spain, England. (O'Connor)

ART 268. SEMINAR IN LITERARY SOURCES OF ART HISTORY. (3)

Art historical sources from Pliny to Malraux. (Levitine)

ART 270. SEMINAR IN MEDIEVAL ART. (3)

Prerequisite, ART 166 or 167 or permission of instructor. (Denny)

ART 272. SEMINAR. PROBLEMS IN MEDIEVAL ICONOGRAPHY. (3)

Prerequisite, ART 166 or 167 or permission of instructor. Studies of selected problems in the religious meaning of Medieval iconography. Some reading knowledge of French, German and Latin is desirable. (Denny)

ART 274. ROMANESQUE ART. (3)

Painting and sculpture in Western Europe in the 11th and 12 centuries; regional styles; relationships between styles of painting and sculpture; religious content. (Denny)

ART 276. GOTHIC ART. (3)

Painting and sculpture in Western Europe in the 13th and 14th centuries; regional styles; relationships between styles of painting and sculpture; religious content. (Denny)

ART 280. METHODS OF ART HISTORY. (3)

Methods of research and criticism applied to typical art-historical problems; bibliography and other research tools. May be repeated for a total of six credits. (Staff)

ART 282, 283. MUSEUM TRAINING PROGRAM. (3, 3)

Year course. Open to one or two selected students. Theory and practice. Students will be directly involved in all phases of the Department's Gallery Exhibition program (research, planning, exhibition, catalog). (Gerdt)

ART 284. SEMINAR. PROBLEMS IN ARCHITECTURAL HISTORY AND CRITICISM. (3)

(Staff)

ART 286. SEMINAR IN LATIN-AMERICAN ART. (3)

Prerequisite, ART 153 or permission of instructor. (Lynch)

ART 288. SEMINAR IN MODERN MEXICAN ART. (3)

Prerequisite, ART 153 or permission of instructor. Problems of Mexican art of the 19th and 20th centuries, *Mexicanismo*; the "Mural Renaissance"; architectural regionalism. (Lynch)

ART 292, 293. DIRECTED GRADUATE STUDIES IN STUDIO ART. (3, 3)

For advanced graduate students by permission of Chairman of Department.
Course may be repeated for credit if content differs. (Staff)

ART 294, 295. DIRECTED GRADUATE STUDIES IN ART HISTORY. (3, 3)

For advanced graduate students by permission of Chairman of Department.
Course may be repeated for credit if content differs. (Staff)

ART 399. THESIS RESEARCH. (1-6)

ASTRONOMY

Professor and Chairman: LASTER

Professor and Director of Astronomy: WESTERHOUT

Professors: ERICKSON, KERR (Vis.), MUSEN (P. T.) AND OPIK

Associate Professors: MATTHEWS, SMITH AND WENTZEL

Assistant Professors: BELL, A'HEARN AND HARRINGTON

The Department of Physics and Astronomy offers a major in Astronomy. The Astronomy Program office is located in the Space Sciences Building. Astronomy students are given a strong undergraduate preparation in astronomy, physics and mathematics, as well as encouragement to take a wide range of other liberal arts courses. The Astronomy Program is designed to be quite flexible, in order to take advantage of students' special talents or interests after the basic requirements for a sound astronomy education have been met. Students preparing for graduate studies will have an opportunity to choose from among many advanced courses available in astronomy, mathematics and physics. The program is designed to prepare students for graduate work as well as for positions in governmental and industrial laboratories and observatories.

Students intending to major in astronomy who have had a high school course in physics, and who have adequate preparation in mathematics to qualify for admission to MATH 018 will ordinarily take the introductory physics courses, PHYS 015, 016, 017 and 018, during their freshman and sophomore years. Those students who do not decide to major in astronomy or physics until after their freshman or sophomore year will normally have taken other introductory courses in physics (i.e., PHYS 010, 011 or PHYS 020, 021). Students will find recommended course programs in the pamphlet entitled "Department Requirements for a B.S. Degree in Astronomy" which is available from the Department of Physics and Astronomy. This pamphlet outlines many different approaches for an astronomy major.

ASTR 010 (Descriptive and Analytical Astronomy) is the introductory astronomy course required of astronomy majors. It may be taken in the freshman or sophomore year. Concurrent registration in ASTR 005 is most strongly recommended for astronomy majors. Occasionally a student may not decide to major in astronomy until after he has already taken ASTR 001 and 002 (Introduction to Astronomy and Modern Astronomy). These courses together may be substituted for the ASTR 010 requirement, but only students with a grade of B or better in ASTR 001 and 002 will be encouraged to major in astronomy.

REQUIRED COURSES FOR A MAJOR IN ASTRONOMY (STARTING WITH PHYS 015-018)

- (a) *Introductory Physics Courses.* PHYS 015, 016—Introductory Physics, Mechanics, Fluids, Heat, and Sound (4, 4), followed by PHYS 017—Introductory Physics, Electricity and Magnetism (4) and PHYS 018—Introductory Physics, Optics and Modern Physics (4). (Total 16 credits)
- (b) *Physics Laboratory.* At least four credits of laboratory courses; ordinarily PHYS 060, 061, but 100, 109 may be added.
- (c) *Modern Physics.* PHYS 118, 119 (3, 3)
- (d) *Supporting Courses.* MATH 019, 020, 021, 022—Analysis (4, 4, 4, 4). (Astronomy majors are encouraged to enter the accelerated math sections which cover these courses in three terms). These must be followed by at least one additional 3 credit mathematics course approved by the astronomy adviser. [Examples are MATH 066—Differential Equations for Scientists and Engineers (3), MATH 163—Analysis for Scientists and Engineers II (3), MATH 113—Introduction to Complex Variables (3), and MATH 110—Advanced Calculus (3)]. (Minimum 19 credits).
- (e) *Introductory Astronomy Courses.* Normally ASTR 005 and ASTR 010. ASTR 001 and 002 may be substituted for ASTR 010. (See above.)
- (f) *Advanced Astronomy Courses.* ASTR 100 and at least one other Astronomy course at the 100 level. (Minimum 6 credits).

REQUIRED COURSES FOR A MAJOR IN ASTRONOMY (STARTING WITH PHYSICS 020, 021)

- (a) *Introductory Physics Courses.* PHYS 020, 021—General Physics (5, 5).
- (b) *Physics Laboratory.* At least four credits of laboratory courses, ordinarily PHYS 060, 061.
- (c) *Additional Physics Courses.* PHYS 106—Mechanics (3), PHYS 118, 119—Modern Physics (3,3), and PHYS 104—Electricity and Magnetism (3) (except when omission is recommended by the student's adviser).
- (d), (e) and (f) same as above.

Students may major in Astronomy only if a grade of C is attained in each semester of the introductory Physics and Astronomy courses. Any student who wishes to be recommended for graduate work in astronomy must maintain a B average and should also consider including some or all of the following courses in his program in addition to those required of all astronomy majors.

- (a) *Astronomy.* One additional course at the 100 level.
- (b) *Physics.* PHYS 127-128 (4,4)—Mathematical Physics; and one or more of those listed below.
- (c) *Supporting Courses.* At least two additional mathematics courses, generally selected from the following: MATH 114—Differential Equations (3); STAT 110—Introduction to Probability Theory (3); MATH 164—Analysis for Scientists and Engineers III (3); MATH 168—Numerical Methods for Scientists and Engineers (3).

Other Physics courses [in addition to PHYS 127, 128—Mathematical Physics

(4,4)] that astronomy majors should consider, both those terminating at the B.S. and those planning on graduate studies, are the following:

PHYS 102, 103—Optics and Applied Optics

PHYS 123—Introduction to Atmospheric and Space Physics

PHYS 124—Plasma Physics

PHYS 126—Kinetic Theory of Gases

PHYS 129—Elementary Particles

PHYS 144, 145—Methods of Theoretical Physics

PHYS 152—Thermodynamics and Statistical Mechanics

PHYS 120—Nuclear Physics

HONORS IN ASTRONOMY

The Honors Program offers to students of exceptional ability and interest in astronomy an educational program with a number of special opportunities for learning. Honors sections are offered in several courses, and there are many opportunities for part-time research participation which may develop into full-time summer projects. An honors seminar is offered for advanced students; credit may be given for independent work or study; and certain graduate courses are open for credit toward the bachelor's degree.

Students for the Honors Program are accepted by the Department's Honors Committee on the basis of recommendations from their advisers and other faculty members. A final written and oral comprehensive examination in the senior year concludes the program which may lead to graduation "with Honors (or High Honors) in Astronomy."

ASTR 001. INTRODUCTION TO ASTRONOMY. (3)

Every semester. An elementary course in descriptive astronomy, especially appropriate for non-science students. Sun, moon, planets, stars and nebulae, galaxies, evolution. The course is illustrated with slides and demonstrations of instruments. (Westerhout, Wentzel, A'Hearn)

ASTR 002. INTRODUCTION TO MODERN ASTRONOMY. (3)

Spring semester. Three lectures per week. Prerequisite, ASTR 001. An elementary course in modern astronomy elaborating on some of the topics which could only be mentioned briefly in ASTR 001. Appropriate for non-science students. (Wentzel, Smith)

ASTR 005. ASTRONOMY LABORATORY. (1)

Fall and spring semesters. Two hours of laboratory per week. Prerequisite, previous or concurrent enrollment in ASTR 001 or 010. Exercises in the use of celestial coordinates, measurement of position, determination of time of day and night; study of photographs of stars, nebulae and galaxies, and spectra; photoelectric photometry; demonstration of astronomical instruments, daytime and nighttime observations if weather permits. Appropriate for non-science majors. (Smith, Matthews)

ASTR 010. DESCRIPTIVE AND ANALYTICAL ASTRONOMY. (3)

Fall semester. Three lectures per week. A general survey course intended for science majors. Prerequisite, MATH 018 or equivalent; a knowledge of trigonometry and logarithms will be assumed. This introductory course will deal with the sun and the solar system, stars and astro-physics, stellar systems and cosmology. It should not be taken by students who have already taken ASTR 001 and 002. (Smith)

ASTR 100. OBSERVATIONAL ASTRONOMY. (3)

Second semester. Two lectures and two hours of laboratory work per week. Prerequisite, MATH 021 and at least 12 credits of introductory physics and astronomy courses. Introduction to the methods of astronomical photometry and spectroscopy. (A'Hearn)

ASTR 101. INTRODUCTION TO GALACTIC RESEARCH. (3)

First semester. Three lectures per week. Prerequisite, MATH 021 and at least 12 credits of introductory physics and astronomy courses. Stellar motions, methods of galactic research, study of our own and nearby galaxies, clusters of stars. (Kerr)

ASTR 102. INTRODUCTION TO ASTROPHYSICS. (3)

Second semester. Three lectures per week. Pre- or co-requisite, PHYS 119 or consent of instructor. Spectroscopy, structure of the atmospheres of the sun and other stars. Observational data and curves of growth. Chemical composition. (Bell)

ASTR 110. INTRODUCTION TO RADIO ASTRONOMY. (3)

Three lectures per week. Prerequisite, MATH 021 and at least 12 credits of introductory physics and astronomy courses. Characteristics of extraterrestrial radio noise, sources of radio emission, our own and external galaxies, the sun, radio telescopes, and basic observational techniques. (Westerhout)

ASTR 124. CELESTIAL MECHANICS. (3)

Three lectures a week. Prerequisite, PHYS 127 or consent of instructor. Celestial mechanics, orbit theory, equations of motion. (Musen)

ASTR 150. SPECIAL PROBLEMS IN ASTRONOMY.

Given each semester. Prerequisite, major in physics or astronomy and/or consent of adviser. Research or special study. Credit according to work done. (Staff)

ASTR 190. HONORS SEMINAR.

Credit according to work done, each semester. Enrollment is limited to students admitted to the Honors Program in Astronomy. (Staff)

ASTR 200. DYNAMICS OF STELLAR SYSTEMS. (3)

First semester. Three lectures per week. Prerequisite, PHYS 200 or ASTR 101. Theory of stellar encounters. Study of the structure and evolution of dynamical systems encountered in astronomy. (Staff)

ASTR 202. STELLAR INTERIORS. (3)

Three lectures per week. Prerequisites, MATH 114 and PHYS 119 or consent of instructor. A study of stellar structure and evolution. (Wentzel)

ASTR 203. STELLAR ATMOSPHERES. (3)

Three lectures per week. Prerequisite, PHYS 212 or consent of the instructor. Observational methods, line formation, curve of growth, equation of transfer, stars with large envelopes, variable stars, novae, magnetic fields in stars. (Bell)

ASTR 204. PHYSICS OF THE SOLAR SYSTEM. (3)

Three lectures per week. Prerequisite, PHYS 119. A survey of the problems of interplanetary space, planetary structure and atmosphere, physics of the earth's upper atmosphere, motions of particles in the earth's magnetic field. (Opik)

ASTR 210. GALACTIC RADIO ASTRONOMY. (3)

Three lectures per week. Prerequisites, PHYS 119, ASTR 101, and ASTR 110; or consent of the instructor. Theory and observations of the continuum and 21 cm line emission from the Galaxy; galactic structure and the sources of radio emission. (Kerr, Westerhout)

ASTR 212. PHYSICS OF THE SOLAR ENVELOPE. (3)

Three lectures per week. Prerequisites, PHYS 119, ASTR 102, and ASTR 110; or consent of the instructor. Physics of solar phenomena, such as solar flares, structure of the Corona and the Chromosphere; radio emission from the sun. (Smith, Erickson)

ASTR 214. INTERSTELLAR MATTER. (3)

Three lectures per week. Pre- or co-requisites, PHYS 213, ASTR 101 or ASTR 102, or consent of instructor. A study of the physical properties of interstellar gas and dust. (Staff)

ASTR 230. SEMINAR. (1)

Seminars on various topics in advanced astronomy are held each semester, with the contents varied each year. One credit for each seminar each semester. (Staff)

ASTR 248, 249. SPECIAL TOPICS IN MODERN ASTRONOMY.

Credit according to work done each semester. Prerequisite, consent of instructor. (Staff)

ASTR 399. RESEARCH.

Credit according to work done, each semester. Prerequisite, an approved application for admission to candidacy or special permission of the Department of Physics and Astronomy. (Staff)

BOTANY

Professor and Chairman: KRAUSS.

Professors: BAMFORD, CORBETT, GAUCH, D. T. MORGAN, SISLER, STERN AND WEAVER.

Research Professor: SOROKIN.

Associate Professors: BROWN, GALLOWAY, KANTZES, KRUSBERG, LOCKARD, MANS, O. D. MORGAN AND RAPPLEYE.

Assistant Professors: BEAN, CURTIS, HARRISON, KARLANDER, KLARMAN, PATTERSON AND TERBORGH.

Research Associate: NORTON.

Instructors: EDWARDS, OWENS, PRITCHARD.

Botany is recognized as both a major and a minor field in Arts and Sciences, the major leading to the B.S. (and with some majors the B.A.) degree. The Botany Department is administered by the College of Agriculture, but students register for botany courses and major or minor in this subject just as if the Department were in the College of Arts and Sciences.

Freshman should consult their lower division adviser and also the Botany Department adviser in planning the major program. The four lower division courses, BOTN 001, 002—General Botany; BOTN 020—Diseases of Plants; and BOTN 011—Plant Taxonomy (total 15 credit hours) should be taken

during the first two years. Sufficient upper division courses to give a total of 36 credit hours in botany must be taken. Included in these will be BOTN 101—Plant Physiology; BOTN 110—Plant Microtechnique; BOTN 111—Plant Anatomy; BOTN 102—Plant Ecology; BOTN 117—General Plant Genetics; and electives.

The botany electives chosen depend in part on the student's chief interest. To support the courses in botany, major students are required to take CHEM 001, 003—General Chemistry; MATH 010, 011—Introduction to Mathematics (or MATH 018, 019) as a minimum; PHYS 010, 011—Fundamentals of Physics; ZOOL 001—General Zoology; MICB 001—General Microbiology; and 12 hours of a modern language, preferably German. CHEM 031, 033—Organic Chemistry; and MATH 014, 015—Calculus, are strongly recommended. Other courses to meet the requirements of the major are to be chosen with the aid of a faculty adviser. Additional information about the curriculum in botany may be obtained at the departmental office.

The courses which are listed present only the undergraduate offerings, some of which are open to graduate students. Persons interested in knowing what the offerings are at the graduate level (200, 300) should consult the Graduate School catalog.

BOTN 001. GENERAL BOTANY. (4)

First and second semesters. Summer session. Two lectures and two laboratory periods a week. General introduction to botany, touching briefly on all phases of the subject. Emphasis is on the fundamental biological principles of the higher plants.
(Stern and Departmental Faculty)

BOTN 002. GENERAL BOTANY. (4)

Second semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 001 or equivalent. A brief evolutionary study of algae, fungi, liverworts, mosses, ferns and their relatives, and the seed plants, emphasizing their structure, reproduction, habitats, and economic importance.

BOTN 010. PRINCIPLES OF CONSERVATION. (3)

First semester. Three lectures per week. A study of the principles of economical use of our natural resources, including water, soil, plants, minerals, wildlife and man.
(Harrison)

BOTN 011. PLANT TAXONOMY. (3)

Second semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 001, or equivalent. An introductory study of plant classification, based on the collection and identification of local plants.
(Brown)

BOTN 020. DISEASES OF PLANTS. (4)

First semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 001, or equivalent. An introductory study of the symptoms and casual agents of plant disease and measure for their control.
(Klarman)

For Advanced Undergraduates and Graduates

BOTN 110. PLANT MICROTECHNIQUE. (3)

Second semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 001, or equivalent. Examinations, including the preparation of temporary and permanent mounts, and photomicrography.
(Stern)

BOTN 195. TUTORIAL READINGS IN BOTANY. (Honors Course) (2 or 3)

Prerequisite, admission to the Department of Botany Honors Program. A review of the literature dealing with a specific research problem in preparation for original research to be accomplished in BOTN 196. Papers will be assigned and discussed in frequent sessions with the instructor.

(Galloway and Departmental Faculty)

BOTN 196. RESEARCH PROBLEMS IN BOTANY. (Honors Course) (2 or 3)

Prerequisite, BOTN 195. The candidate for Honors will pursue a reasearch problem under the direction and close supervision of a member of the faculty.

BOTN 199. SEMINAR. (1)

First and second semesters. Two semester hours maximum credit. Prerequisite, permission of instructor. Discussion and readings on special topics, current literature, or problems and progress in all phases of botany. Minor experimental work may be pursued if facilities and the qualifications of the students permit. For seniors only, majors and minors in botany or biological science.

(Terborgh)

PLANT PHYSIOLOGY*For Advanced Undergraduates and Graduates***BOTN 101. PLANT PHYSIOLOGY. (4)**

First semester. Two lectures and one 4-hour laboratory period a week. Prerequisites, BOTN 001 and General Chemistry. Organic Chemistry strongly recommended. A survey of the general physiological activities of plants.

(Patterson)

BOTN 102. PLANT ECOLOGY. (2)

Second semester. Prerequisite, BOTN 001. The dynamics of populations as affected by environmental factors with special emphasis on the structure and composition of natural plant communities, both terrestrial and aquatic.

(Terborgh)

BOTN 103. PLANT ECOLOGY LABORATORY. (1)

Prerequisite, BOTN 102 or its equivalent or concurrent enrollment therein. One three-hour laboratory period a week. The application of field and experimental methods to the qualitative and quantitative study of vegetation and environmental factors.

(Terborgh)

PLANT MORPHOLOGY, CYTOLOGY AND TAXONOMY*For Advanced Undergraduates and Graduates***BOTN 111. PLANT ANATOMY. (3)**

First semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 110, or equivalent. The origin and development of the organs and tissue systems in the vascular plants.

(Rappleye)

BOTN 113. PLANT GEOGRAPHY. (2)

First semester. Prerequisite, BOTN 001, or equivalent. A study of plant distribution throughout the world and the factors generally associated with such distribution.

(Brown)

BOTN 115. STRUCTURE OF ECONOMIC PLANTS. (3)

Second semester. (Not offered 1969-1970). One lecture and two laboratory periods a week. Prerequisite, BOTN 111. A detailed microscopic study of the anatomy of the chief fruit and vegetable crops.

(Rappleye)

BOTN 116. HISTORY AND PHILOSOPHY OF BOTANY. (1)

First semester. Prerequisites, 20 semester hours credit in biological sciences, including BOTN 001 or equivalent. Discussion of the development and ideas and knowledge about plants, leading to a survey of contemporary work in botanical science. (Bamford)

BOTN 117. GENERAL PLANT GENETICS. (2)

Second semester. Prerequisite, BOTN 001 or equivalent. The basic principles of plant genetics are presented; the mechanics of transmission of the hereditary factors in relation to the life cycle of seed plants, the genetics of specialized organs and tissues, spontaneous and induced mutations of basic and economic significance, gene action, genetic maps, the fundamentals of polyploidy, and genetics in relation to methods of plant breeding are the topics considered. (Mans)

BOTN 136. PLANTS AND MANKIND. (2)

First semester. Prerequisite, BOTN 001 or equivalent. A survey of the plants which are utilized by man, the diversity of such utilization, and their historic and economic significance. (Rappleye)

BOTN 151S. TEACHING METHODS IN BOTANY. (2)

Summer session. Four two-hour laboratory demonstration periods per week, for eight weeks. Prerequisite, BOTN 001, or equivalent. A study of the biological principles of common plants, and demonstrations, projects, and visual aids suitable for teaching in primary and secondary schools. (Lockard)

BOTN 153. FIELD BOTANY AND TAXONOMY. (2)

Summer session. Prerequisite, BOTN 001 or General Biology. Four two-hour laboratory periods a week for eight weeks. The identification of trees, shrubs, and herbs, emphasizing the native plants of Maryland. Manuals, keys, and other techniques will be used. Numerous short field trips will be taken. Each student will make an individual collection. (Brown)

BOTN 161. SYSTEMATIC BOTANY. (2)

Fall semester. (Not offered 1968-1969). Two two-hour laboratory periods a week. Prerequisite, BOTN 011 or equivalent. An advanced study of the principles of systematic botany. Laboratory practice with difficult plant families including grasses, sedges, legumes, and composites. Field trips arranged. (Brown)

PLANT PATHOLOGY*For Advanced Undergraduates and Graduates***BOTN 122. RESEARCH METHODS IN PLANT PATHOLOGY. (2)**

Second semester. Two laboratory periods a week. Prerequisite, BOTN 020, or equivalent. Advanced training in the basic research techniques and methods of plant pathology. (Curtis)

BOTN 127. DIAGNOSIS AND CONTROL OF PLANT DISEASES. (3)

Second semester. Three lectures per week. A study of various plant diseases grouped according to the manner in which the host plants are affected. Emphasis will be placed on recognition of symptoms of the various types of diseases and on methods of transmission and control of the pathogens involved. (Bean)

BOTN 128. MYCOLOGY. (4)

Second semester. (Not offered 1969-1970). An introductory study of the morphology, classification, life histories, and economics of the fungi.

BOTN 152S. FIELD PLANT PATHOLOGY. (1)

Summer session. Daily lecture for three weeks. Prerequisite, BOTN 020, or equivalent. Given in accordance with demand. A course for county agents and teachers of vocational agriculture. Discussion and denomination of the important diseases in Maryland crops. (Kantzes)

CHEMISTRY

Professor and Chairman: VANDERSLICE*.

Professor and Associate Chairman: JAQUITH.

Professors: ATKINSON, BENEDICT*, BENESCH*, GRIM, KEENEY, LIPPINCOTT, PRATT, PURDY, REEVE, ROLLINSON, STEWART, SVIRBLEY, VEITCH, AND WHITE.

Research Professors: BAILEY, ZWANZIG*.

Associate Professors: BOYD, DEROCOCCO*, GARDNER, HENERY-LOGAN, HOLMLUND, HUHEEY, KASLER, KRISHER*, LAKSHMANAN, MUNN*, PICKARD, SENGERS*, STUNTZ, AND VIOLA.

Assistant Professors: BELLAMA, CARRUTHERS, GINTER*, JACKSON, JARVIS, KHANNA, MAZZOCCHI, MILLER, O'HAYER, SPAIN*, STALEY, AND VERBEKE*.

The extent of the science of chemistry necessitates completion of a well-planned course of undergraduate study before specialization. The curriculum outlined below describes such a course of study. The sequence of courses given should be followed as closely as possible. All of the chemistry courses listed are required. The electives must include four lecture credits selected from two of the following courses (one must be in chemistry): CHEM 125, CHEM 143, CHEM 195, MATH 066, and an advanced course in mathematics or physics that has MATH 021 as a prerequisite. The electives must also include CHEM 144 or CHEM 186 or CHEM 199H; CHEM 199H can be elected only by students in the chemistry honors program, and must be taken in the second semester of the senior year. Further information concerning the honors program in chemistry may be obtained from the Chemistry Department Honors Committee.

First Semester		First Year		Second Semester	
Chemistry 005	4	Chemistry 015	4	Chemistry 015	4
Mathematics 018	3	Mathematics 019	4	Mathematics 019	4
English 001 or 021	3	English 003	3	English 003	3
General Education	3	Physics 030	3	Physics 030	3
Health 005	2	Speech 007	2	Speech 007	2
Physical Education	1	Physical Education	1	Physical Education	1
	16		17		17
First Semester		Second Year		Second Semester	
Chemistry 035	2	Chemistry 037	2	Chemistry 037	2
Chemistry 040	1	Chemistry 042	1	Chemistry 042	1
Mathematics 020	4	Chemistry 021	4	Chemistry 021	4
Physics 031	4	Mathematics 021	4	Mathematics 021	4
English 004	3	Physics 032	4	Physics 032	4
	14		15		15

* Member of the Institute for Molecular Physics.

Third Year

First Semester		Second Semester	
Chemistry 187	3	Chemistry 189	3
Chemistry 182	1	Chemistry 184	1
Chemistry 141	2	Chemistry 148	2
German 001	3	German 002	3
General Education	3	General Education	3
Electives	4	Electives	4
<hr/>		<hr/>	
16		16	

Fourth Year

First Semester		Second Semester	
Chemistry 123	3	Chemistry 101	3
German 006	3	German 008	3
General Education	3	Electives	6
Electives	6	General Education	3
<hr/>		<hr/>	
15		15	

CHEM 001, 003. GENERAL CHEMISTRY. (4, 4)

Two lectures, one quiz, and one three-hour laboratory period each week. Prerequisite, 1 year high school algebra or equivalent. (Staff)

CHEM 005. ADVANCED GENERAL CHEMISTRY. (4)

First semester. Three lectures and one three-hour laboratory period per week. Prerequisite, high school chemistry, placement in mathematics group I or II, and permission of the Chemistry Department. An advanced course in general chemistry for chemistry majors, which must be followed by CHEM 015. (Staff)

CHEM 011, 013. GENERAL CHEMISTRY. (3, 3)

Two lectures and one three-hour laboratory period per week. An abbreviated course in general chemistry for students in home economics and pre-nursing. This course is open only to students registered in home economics and pre-nursing. (Staff)

CHEM 015. QUALITATIVE ANALYSIS. (4)

Two lectures and two three-hour laboratory periods per week. Prerequisite, CHEM 003 or CHEM 005. (Staff)

CHEM 017. EQUILIBRIUM AND STOICHIOMETRY. (2)

First semester. Two lectures per week. Prerequisite, CHEM 003. A systematic study of the equilibria and stoichiometry involved in acid-base, precipitation, complex formation, and oxidation-reduction reactions. Not open to students with credit in CHEM 019 or 021. (Staff)

CHEM 019. ELEMENTS OF QUANTITATIVE ANALYSIS. (4)

Two lectures and two three-hour laboratory periods per week. Prerequisite, CHEM 003. An introduction to the basic theory and techniques of volumetric and gravimetric analysis. Primarily for students in engineering, agriculture, pre-medical, and pre-dental curricula. (Stuntz)

CHEM 021. QUANTITATIVE ANALYSIS. (4)

Second semester. Two lectures and two three-hour laboratory periods per week. Prerequisite, CHEM 015. An intensive study of the theory and techniques of inorganic quantitative analysis, covering primarily volumetric methods. Required of all students majoring in chemistry. (Stuntz)

CHEM 023. INORGANIC STRUCTURES AND CHEMICAL BONDING. (2)

Second semester. Two lectures per week. Prerequisite, CHEM 017, 019, or 021. Atomic structure, elementary molecular structure, chemical bonding from valence bond approach and from molecular orbital approach, bonding in coordination compounds, and the ionic bond. (Staff)

CHEM 031, 033. ELEMENTS OF ORGANIC CHEMISTRY. (3, 3)

Two lectures and one three-hour laboratory period per week. Prerequisite, CHEM 003, 005, or 013. Organic chemistry for students in agriculture, bacteriology, and home economics. (Reeve)

CHEM 035, 037. ELEMENTARY ORGANIC CHEMISTRY. (2, 2)

Two lectures per week. Prerequisite, CHEM 003 or 005. A course for chemists, chemical engineers, pre-medical students, and pre-dental students. (Staff)

CHEM 036, 038. ELEMENTARY ORGANIC LABORATORY. (2, 2)

Two three-hour laboratory periods per week. Prerequisite, CHEM 003, or 005; CHEM 035, 037 must be taken concurrently. (Staff)

CHEM 040, 042. ORGANIC CHEMISTRY LABORATORY FOR CHEMISTRY MAJORS. (1, 1)

One three-hour laboratory period per week. Prerequisite, CHEM 003 or 005; CHEM 035, 037 must be taken concurrently. (Staff)

CHEM 101. INORGANIC CHEMISTRY. (3)

Three lectures per week. Prerequisite, CHEM 187. (Staff)

CHEM 102. INORGANIC PREPARATIONS. (2)

Two three-hour laboratory periods per week. Prerequisite, CHEM 123. (Boyd)

CHEM 110. RADIOCHEMICAL SAFETY PROCEDURES. (1)

One lecture per week. A lecture and demonstration course. Radiation hazards, principles and practices of radiation safety, federal (AEC, ICC) codes and state public health laws, etc., will be discussed. Consent of the instructor must be obtained. No credit towards a degree allowed for chemistry majors. (Lakshmanan)

CHEM 111. CHEMICAL PRINCIPLES. (4)

Two lectures and two three-hour laboratory periods per week. Prerequisite, CHEM 003, or equivalent. Not open to students seeking a major in the physical sciences, since the course content is covered elsewhere in their curricula. A course in the principles of chemistry with accompanying laboratory work consisting of simple quantitative experiments. (Credit applicable only toward degree in College of Education.) (Jaquith)

CHEM 112, 113. SPECIAL PROBLEMS IN CHEMISTRY TEACHING. (3, 3)

One four-hour meeting per week. An intensive study of secondary school chemistry courses with particular attention to the Chemical Education Material Study course. Major emphasis will be placed on the chemical principles and the philosophy underlying the CHEM Study program. Credit applicable toward degrees in the College of Education only. Prerequisite, CHEM 001, 003 or its equivalent, and enrollment in the NSF In-Service Institute for Secondary School Chemistry Teachers, or consent of the instructor. (Jaquith)

CHEM 115. A SURVEY OF ORGANIC CHEMISTRY. (3)

Summer School only. Open ONLY to registrants in the National Science Foundation Summer Institute. Five one-hour lectures per week; five three-hour laboratory periods per week. A systematic survey of compounds of carbon at the elementary level. (Staff)

CHEM 121. INTERMEDIATE QUANTITATIVE ANALYSIS. (4)

Two lectures and two three-hour laboratory periods per week. Prerequisites, CHEM 019 or 021, and CHEM 033 or 037. A continuation of CHEM 019 or 021, including volumetric, gravimetric, electrometric, and colorimetric methods. Intended for students in agricultural chemistry, general physical science, science education, etc. Not open to chemistry majors. (Staff)

CHEM 123. ADVANCED QUANTITATIVE ANALYSIS. (4)

Two lectures and two three-hour laboratory periods per week. Pre- or co-requisite, CHEM 189. A continuation of CHEM 021, including volumetric, gravimetric, electrometric, and colorimetric methods. Required of all students majoring in chemistry. (Purdy)

CHEM 125. INSTRUMENTAL ANALYSIS. (4)

Second semester. Two lectures and six hours of laboratory per week. Pre-requisite, CHEM 189. A study of the application of physicochemical methods to analytical chemistry. Techniques such as polarography, potentiometry, conductivity and spectrophotometry will be included. (Purdy)

CHEM 141, 143. ADVANCED ORGANIC CHEMISTRY. (2, 2)

Two lectures per week. Prerequisite, CHEM 037, 038. An advanced study of the compounds of carbon. (Reeve)

CHEM 144. ADVANCED ORGANIC LABORATORY. (2-4)

Two or four three-hour laboratory periods per week. Prerequisites, CHEM 037, 038. (Pratt)

CHEM 148. THE IDENTIFICATION OF ORGANIC COMPOUNDS. (2)

Two three-hour laboratory periods per week. Prerequisite, CHEM 141. The systematic identification of organic compounds. (Pratt)

CHEM 150. ORGANIC QUANTITATIVE ANALYSIS. (2)

Two three-hour laboratory periods per week. Prerequisites, CHEM 019 or 021, and consent of the instructor. The semi-micro determination of carbon, hydrogen, nitrogen, halogen and certain functional groups. (Kasler)

CHEM 161. CHEMICAL BACKGROUND FOR BIOCHEMISTRY. (2)

Two lectures per week. Prerequisite, CHEM 033 or CHEM 037. Organic and physical chemical properties of biologically important compounds and systems. (Holmlund)

CHEM 163. BIOCHEMISTRY. (3)

Three lectures per week. Prerequisite, CHEM 161. (Holmlund)

CHEM 162, 164. BIOCHEMISTRY LABORATORY. (2, 2)

Two three-hour laboratory periods per week. Prerequisite, CHEM 033, CHEM 038 or CHEM 042; CHEM 161 or 163, (or concurrent registration in CHEM 161 or CHEM 163). (Staff)

CHEM 182, 184. PHYSICAL CHEMISTRY LABORATORY FOR CHEMISTRY MAJORS. (1, 1)

One three-hour laboratory period per week. Prerequisite, CHEM 019 or 021; CHEM 187, 189 must be taken concurrently. (Staff)

CHEM 186. ADVANCED PHYSICAL CHEMISTRY LABORATORY. (2)

Two three-hour laboratory periods per week. Prerequisites, CHEM 184, CHEM 189. (Staff)

CHEM 187, 189. PHYSICAL CHEMISTRY. (3, 3)
 Three lectures per week. Prerequisite, CHEM 017, 019 or 021; PHYS 021; MATH 021; or consent of instructor. A course primarily for chemists and chemical engineers. This course must be accompanied by CHEM 188, 190.
 (Staff)

CHEM 188, 190. PHYSICAL CHEMISTRY LABORATORY. (2, 2)
 Two three-hour laboratory periods per week. A laboratory course for chemical engineering students taking CHEM 187, 189. Students who have had CHEM 019, 021, or equivalent cannot register for this course.
 (Staff)

CHEM 192, 194. GLASSBLOWING LABORATORY. (1, 1)
 One three-hour laboratory period per week. Prerequisite, consent of instructor.
 (Carruthers)

CHEM 195. ADVANCED PHYSICAL CHEMISTRY. (2)
 Prerequisite, CHEM 189. Quantum chemistry and other selected topics.
 (Staff)

CHEM 199H. SPECIAL PROJECTS. (2)
 Honors projects for undergraduate students.
 (Staff)

For Graduates

CHEM 201. ADVANCED INORGANIC CHEMISTRY. (2)
 First semester. Two lectures per week.
 (Staff)

CHEM 202, 204. ADVANCED INORGANIC LABORATORY. (2, 2)
 Two three-hour laboratory periods per week.
 (Boyd)

CHEM 203. THE CHEMISTRY OF THE RARER ELEMENTS. (2)
 Second semester. Two lectures per week.
 (White)

CHEM 205. RADIOCHEMISTRY. (2)
 Two lectures per week.
 (Rollinson)

CHEM 206, 208. SPECTROGRAPHIC ANALYSIS. (1, 1)
 One three-hour laboratory period per week. Registration limited. Prerequisites, CHEM 184 and consent of the instructor.
 (White)

CHEM 207. CHEMISTRY OF COORDINATION COMPOUNDS. (2)
 Two lectures per week.
 (Rollinson)

CHEM 209. NON-AQUEOUS INORGANIC SOLVENTS. (2)
 Two lectures per week.
 (Jaquith)

CHEM 210. RADIOCHEMISTRY LABORATORY. (1-2)
 One or two four-hour laboratory periods per week. Registration limited. Pre- or co-requisites, CHEM 205 and consent of instructor.
 (Lakshmanan)

CHEM 211. CHEMISTRY OF ORGANOMETALLIC COMPOUNDS. (2)
 Two lectures per week.
 (Grim)

CHEM 213. SELECTED TOPICS IN INORGANIC CHEMISTRY. (2)
 Two lectures a week. Prerequisite, CHEM 201, 203 or equivalent. An examination of some current topics in modern inorganic chemistry.
 (Staff)

CHEM 215. NUCLEAR CHEMISTRY. (2)
 Two lecture hours per week. Prerequisite, CHEM 189. An introduction to nuclear chemistry. The more important nuclear decay phenomena; nuclear

models; nuclear spin; reactions in complex nuclei; interactions of radiation with matter. Emphasis is placed on the behavior of heavy elements and nuclear systematics. (Viola)

CHEM 221, 223. CHEMICAL MICROSCOPY. (2, 2)

One lecture and one three-hour laboratory period per week. Registration limited. Prerequisite, consent of instructor. CHEM 221 is a prerequisite for CHEM 223. A study of the use of the microscope in chemistry. CHEM 223 is devoted to study of the optical properties of crystals. (Stuntz)

CHEM 227. OPTICAL METHODS OF QUANTITATIVE ANALYSIS. (3)

Two lectures and one three-hour laboratory per week. Prerequisite, CHEM 123 and 189. The quantitative applications of emission spectroscopy, atomic absorption spectroscopy, ultraviolet, visible, and infrared spectrophotometry, fluorescence, atomic fluorescence, nephelometry, and of certain closely related subjects like NMR and mass spectroscopy. (Staff)

CHEM 229. ELECTRICAL METHODS OF QUANTITATIVE ANALYSIS. (3)

Two lectures and one three-hour laboratory per week. Prerequisites, CHEM 123 and 189. The use of conductivity, potentiometry, polarography, voltammetry, amperometry, coulometry, and chronopotentiometry in quantitative analysis. (Purdy)

CHEM 231. SEPARATION METHODS IN QUANTITATIVE ANALYSIS. (3)

Two lectures and one three-hour laboratory per week. Prerequisites, CHEM 123 and 189. The theory and practical application to quantitative analysis of the various forms of chromatography, ion exchange, solvent extraction, and distillation. (Staff)

CHEM 233. MODERN TRENDS IN ANALYTICAL CHEMISTRY. (2)

Two lectures per week. Prerequisites, CHEM 123 and 189. A study of advanced methods, including topics such as statistical treatment of analytical data, kinetic methods in analytical chemistry, analytical measurements based on radioactivity, and enzymatic techniques. (Staff)

CHEM 240. ORGANIC CHEMISTRY OF HIGH POLYMERS. (2)

Two lectures per week. An advanced course covering the synthesis of monomers, mechanisms of polymerization, and the correlation between structure and properties in high polymers. (Bailey)

CHEM 241. STEREOCHEMISTRY. (2)

Two lectures per week. (Staff)

CHEM 243. MOLECULAR ORBITAL THEORY. (2)

Two lectures per week. A partial quantitative application of molecular orbital theory and symmetry to the chemical properties and reactions of organic molecules. Prerequisites, CHEM 143 and CHEM 189. (Staley)

CHEM 245. THE CHEMISTRY OF THE STEROIDS. (2)

Two lectures per week. (Pratt)

CHEM 249. PHYSICAL ASPECTS OF ORGANIC CHEMISTRY. (2)

Two lectures per week. (Staff)

CHEM 251. THE HETEROCYCLICS. (2)

Two lectures per week. (Pratt)

CHEM 254. ADVANCED ORGANIC PREPARATIONS. (2-4)

Two or four three-hour laboratory periods per week. (Pratt)

CHEM 258. THE IDENTIFICATION OF ORGANIC COMPOUNDS, AN ADVANCED COURSE. (3)

One lecture and two to four three-hour laboratory periods per week. Prerequisite, CHEM 141, 143. (Pratt)

CHEM 261. PROTEINS, AMINO ACIDS, AND CARBOHYDRATES. (2)

Two lectures per week. Prerequisite, CHEM 163 or its equivalent. (Veitch)

CHEM 263. BIOLOGICAL ENERGY TRANSDUCTIONS, VITAMINS, AND HORMONES. (2)

Two lectures per week. Prerequisite, CHEM 163 or its equivalent. (Veitch)

CHEM 265. ENZYMES. (2)

Two lectures per week. Prerequisite, CHEM 163 or its equivalent. (Veitch)

CHEM 267. THE CHEMISTRY OF NATURAL PRODUCTS. (2)

Two lectures per week. Prerequisite, CHEM 143. The chemistry and physiological action of natural products. Methods of isolation, determination of structure, and synthesis. (Henery-Logan)

CHEM 268. SPECIAL PROBLEMS IN BIOCHEMISTRY. (2-4)

Two to four three-hour laboratory periods per week. Prerequisite, CHEM 164 or equivalent. (Veitch)

CHEM 269. ADVANCED RADIOCHEMISTRY. (2)

Second semester. Two lectures per week. Prerequisite, CHEM 163 and CHEM 205. Utilization of radioisotopes with special emphasis on applications to problems in the life sciences. (Lakshmanan)

CHEM 270. ADVANCED RADIOCHEMISTRY LABORATORY. (1-2)

Second semester. One or two four-hour laboratory periods per week. Prerequisites, CHEM 210 and consent of instructor. Registration limited. Laboratory training in utilization of radioisotopes with special emphasis on applications to problems in life sciences. (Lakshmanan)

CHEM 271. BIOCHEMISTRY OF LIPIDS. (2)

Two lectures per week. Prerequisite, CHEM 163 or equivalent. Classification and chemistry of lipids, lipoproteins and energy metabolism of lipids, structural lipids, and endocrine control of lipid metabolism in mammals. (Staff)

CHEM 273. SPECIAL TOPICS IN BIOCHEMISTRY. (2)

Two lectures per week. Prerequisite, CHEM 163 or its equivalent. An examination of some current topics in modern biochemistry. (Staff)

CHEM 275. BIOPHYSICAL CHEMISTRY. (2)

Two lectures per week. Prerequisite, CHEM 161; CHEM 189 or consent of instructor. Use of physical chemical principles in the study of biological phenomena. (Staff)

CHEM 281. THEORY OF SOLUTIONS. (2)

Two lectures per week. Prerequisite, CHEM 307 or equivalent. (Svirbely)

CHEM 285. COLLOID CHEMISTRY. (2)

Prerequisite, CHEM 189 or equivalent. Two lectures per week. (Pickard)

CHEM 287. INFRARED AND ROMAN SPECTROSCOPY. (2)

Two lectures per week. Prerequisite, consent of instructor. (Lippincott)

CHEM 295. HETEROGENEOUS EQUILIBRIA. (2)

Prerequisite, CHEM 189 or equivalent. Two lectures per week. (Pickard)

- CHEM 299. REACTION KINETICS. (3)**
Three lectures per week. (Svirbely)
- CHEM 303. ELECTROCHEMISTRY. (3)**
Prerequisite, CHEM 307 or equivalent. Three lectures per week. (Atkinson)
- CHEM 304. ELECTROCHEMISTRY LABORATORY. (2)**
Two three-hour laboratory periods per week. Prerequisite, consent of instructor. (Svirbely)
- CHEM 307. CHEMICAL THERMODYNAMICS. (3)**
Prerequisite, CHEM 189 or equivalent. Three lectures per week. (Staff)
- CHEM 311. PHYSIOCHEMICAL CALCULATIONS. (2)**
Prerequisite, CHEM 189 or equivalent. Two lectures per week. (Stewart)
- CHEM 313. MOLECULAR STRUCTURE. (3)**
Three lectures per week. (Staff)
- CHEM 317. CHEMICAL CRYSTALLOGRAPHY. (3)**
Three lectures per week. Prerequisite, consent of instructor. A detailed treatment of single-crystal X-ray methods. (Stewart)
- CHEM 319, 321. QUANTUM CHEMISTRY. (3, 3)**
Three lectures per week. Prerequisite for CHEM 319 is CHEM 195. Prerequisite for CHEM 321 is CHEM 319 or PHYS 212. (Staff)
- CHEM 323. STATISTICAL MECHANICS AND CHEMISTRY. (3)**
Three lectures per week. Prerequisite, CHEM 307 or equivalent. (Staff)
- CHEM 351. SEMINAR. (1)** (Staff)
- CHEM 399. RESEARCH.** (Staff)

CLASSICAL LANGUAGES AND LITERATURES

Professor and Chairman: AVERY.

Assistant Professor: HUBBE.

Lecturer: IVERSEN.

Instructor: CLAPPER.

MAJOR IN LATIN: LATN 001, 002, 003, and 004 or their equivalent must have been completed before a student may begin work on a major in Latin. A student majoring in Latin will then begin his concentration with LATN 005. A major consists of a minimum of twenty-four hours beginning with LATN 005, twelve hours of which must be taken in 100-level courses. A major student who has taken LATN 001, 002, 003, and 004 may use credit so obtained to fulfill the twelve-hour foreign language requirement of the College of Arts and Sciences. Those registering initially for LATN 005 must fulfill this requirement in another foreign language, preferably Greek. No course with a grade less than C may be used to satisfy major requirements.

No placement tests are given in the Classical Languages. The following schedule will apply in general in determining the course level at which students will register for Latin and Greek. All students whose stage of achievement is not represented below are urgently invited to confer with the Chairman of the Department.

Students offering 0 or 1 unit of Latin will register for course 001.

Students offering 2 units of Latin will register for course 003.

Students offering 3 units of Latin will register for course 004.

Students offering 4 units of Latin will register for course 005.

No credit will be given for less than two semesters of Elementary Latin or Greek except as provided below in the course description of LATN 001, 002.

LATIN

LATN 001, 002. ELEMENTARY LATIN. (3, 3)

A student who has had two units of Latin in high school may register for LATN 001 for purposes of review, but not for credit; however, he may, under certain conditions, register for LATN 002 for credit with departmental permission.

(Hubbe and Staff)

LATN 003. INTERMEDIATE LATIN (CAESAR). (3)

Prerequisite, LATN 001, 002 or equivalent.

(Staff)

LATN 004. INTERMEDIATE LATIN (CICERO). (3)

Prerequisite, LATN 003 or equivalent.

(Staff)

LATN 005. VERGIL'S AENEID. (3)

Prerequisite, LATN 004 or equivalent.

(Avery)

LATN 051. HORACE. (3)

Prerequisite, LATN 005 or equivalent.

(Avery)

LATN 052. LIVY. (3)

Prerequisite, LATN 051 or equivalent.

(Avery)

LATN 061. PLINY'S LETTERS. (3)

Prerequisite, LATN 052 or equivalent.

(Avery)

LATN 070. GREEK AND ROMAN MYTHOLOGY. (3)

Taught in English, no prerequisite. Cannot be taken for language credit. *This course is particularly recommended for students planning to major in Foreign Languages, English, History, the Fine Arts, or Journalism.*

(Iversen)

For Advanced Undergraduates and Graduates

Prerequisite for 100 level courses, LATN 061.

LATN 101. CATULLUS AND THE ROMAN ELEGIAC POETS. (3)

(Avery)

LATN 102. TACITUS. (3)

(Avery)

LATN 103. ROMAN SATIRE. (3)

(Avery)

LATN 104. ROMAN COMEDY. (3)

(Avery)

LATN 105. LUCRETIVS. (3)

(Avery)

LATN 111. ADVANCED LATIN GRAMMAR. (3)

Prerequisite, three years of college Latin or equivalent. An intensive study of the morphology and syntax of the Latin language supplemented by rapid reading.

(Avery)

LATN 199. LATIN READINGS. (3)

Prerequisite, consent of instructor. The reading of one or more selected Latin authors from antiquity through the Renaissance. Reports. May be repeated with different content. (Avery)

*For Graduates***LATN 210. VULGAR LATIN READINGS. (3)**

Prerequisite, consent of instructor. An intensive review of the phonology, morphology, and syntax of Classical Latin, followed by the study of the deviations of Vulgar Latin from the classical norms, with the reading of illustrative texts. The reading of selections from the *Peregrinato ad loca sancta* and the study of divergences from classical usage therein, with special emphasis on those which anticipate subsequent developments in the Romance Languages. Reports. (Avery)

GREEK**GREK 001, 002. ELEMENTARY GREEK. (3, 3)**

(Hubbe)

GREK 003. INTERMEDIATE GREEK (XENOPHON). (3)

Prerequisite, GREK 001, 002 or equivalent.

(Hubbe)

GREK 004. INTERMEDIATE GREEK (HOMER). (3)

Prerequisite, GREK 003 or equivalent. See GREK 006.

(Hubbe)

GREK 005. HERODOTUS. (3)

Prerequisite, GREK 004 or equivalent.

(Hubbe)

GREK 006. THE NEW TESTAMENT. (3)

Prerequisite, GREK 003 or equivalent. GREK 006 will be substituted for GREK 004 upon demand of a sufficient number of students. (Hubbe)

GREK 051. EURIPIDES. (3)

Prerequisite, GREK 005 or equivalent.

(Hubbe)

GREK 052. PLATO. (3)

Prerequisite, GREK 051 or equivalent.

(Hubbe)

COMPARATIVE LITERATURE

Advisory Committee on Comparative Literature: PROFESSORS FREEDMAN (Chairman), G. JONES, MACBAIN, MCCASKEY, D. SMITH, SPARKS AND MANNING.

Professors: GOODWYN, JONES, MONTANO AND PRAHL.

Associate Professor: MITSAKIS AND DEMAIRE.

Assistant Professors: MCCASKEY, SCHAUHANN AND D. SMITH.

All literature courses numbered 100 or above in the departments of Classics, Foreign Languages and English as well as courses in Comparative Literature are accepted for a major in comparative literature. Students with this major must have a knowledge of at least one approved foreign language demonstrated by successful completion of a course numbered 100 or above in that language.

Of the possible 24-40 hours offered as a major, the following courses are required: CMLT 101-102 and 150.

Six hours of other comparative literature courses.

Course work may not be limited to the nineteenth and twentieth centuries.

LATN 070 is highly recommended.

For Advanced Undergraduates and Graduates

CMLT 101, 102. INTRODUCTORY SURVEY OF COMPARATIVE LITERATURE. (3, 3)

First semester. Survey of the background of European literature through study of Greek and Latin literature in English translations, discussing the debt of modern literature to the ancients. Second semester: study of medieval and modern continental literature. (Schaumann)

CMLT 103. THE OLD TESTAMENT AS LITERATURE. (3)

A study of sources, development and literary types. (Schaumann)

CMLT 105. ROMANTICISM: EARLY STAGES. (3)

First semester. Emphasis on England, France and Germany. Reading knowledge of French or German required. (Demaitre)

CMLT 106. ROMANTICISM: FLOWERING AND INFLUENCE. (3)

Second semester. Emphasis on England, France and Germany. Reading knowledge of French or German required. (Demaitre)

CMLT 107. THE FAUST LEGEND IN ENGLISH AND GERMAN LITERATURE. (3)

A study of the Faust legend of the Middle Ages and its later treatment by Marlowe in *Dr. Faustus* and by Goethe in *Faust*. (Prah1)

CMLT 112. IBSEN AND THE CONTINENTAL DRAMA. (3)

First semester. A study of the life and chief work of Henrik Ibsen with special emphasis on his influence on the modern drama. (D. Smith)

CMLT 114. THE GREEK DRAMA. (3)

The chief works of Aeschylus, Sophocles, Euripides, and Aristophanes in English translations. Emphasis on the historic background, on dramatic structure, and on the effect of the Attic drama upon the mind of the civilized world. (Prah1)

CMLT 115, 116. THE CLASSICAL TRADITION AND ITS INFLUENCE IN THE MIDDLE AGES AND THE RENAISSANCE. (3, 3)

Emphasis on major writers. Reading knowledge of Greek or Latin required. (Staff)

CMLT 125. LITERATURE OF THE MIDDLE AGES. (3)

Narrative, dramatic, and lyric literature of the Middle Ages studied in translation. (Cooley)

CMLT 130. THE CONTINENTAL NOVEL. (3)

The novel in translation from Stendhal through the Existentialists, selected from literatures of France, Germany, Italy, Russia, and Spain. (Staff)

CMLT 135. DANTE AND THE ROMANCE TRADITION. (3)

A reading of the *Divine Comedy* to enlighten the discovery of reality in western literature. (Staff)

CMLT 140, 141. LITERATURE OF THE FAR EAST. (3, 3)

A survey of the literature of China and Japan. First semester: an examination of the development of Chinese and Japanese literature up to the Yuan and

Kamakura period. Second semester: the literature from the fourteenth century to the present. (McCaskey)

CMLT 145. MAJOR CONTEMPORARY AUTHORS. (3)
(Staff)

CMLT 150. CONFERENCE COURSE IN COMPARATIVE LITERATURE. (3)
Second semester: A tutorial type discussion course, correlating the courses in various literatures which the student has previously taken with the primary themes and masterpieces of world literature. This course is required of undergraduate majors in comparative literature, but must not be taken until the final year of the student's program. (Staff)

For Graduates

CMLT 201. PROBLEMS IN COMPARATIVE LITERATURE. (3)
Second semester. A research seminar for M.A. candidates only. (Staff)

CMLT 225. THE MEDIEVAL EPIC. (3)
First semester. A comparative interpretation of *Beowulf*, the *Waltharius*, the *Chanson de Roland*, the *Nibelungenlied*, and the *Cid*. (Jones)

CMLT 226. THE MEDIEVAL ROMANCE. (3)
Second semester. An interpretation of the principal works of the genre. (Jones)

CMLT 230. PROBLEMS OF THE BAROQUE IN LITERATURE. (3)
First semester. The passage from Mannerism to the most characteristic theoretical and creative manifestations of Baroque. (Staff)

CMLT 235. THE ITALIAN RENAISSANCE AND ITS INFLUENCE. (3)
(Staff)

CMLT 240. LITERARY CRITICISM: ANCIENT AND MEDIEVAL. (3)
First semester. From Aristotle to the fifteenth century. (Staff)

CMLT 241. LITERARY CRITICISM: RENAISSANCE AND MODERN. (3)
Second semester. From Petrarch to the present. (Staff)

CMLT 258. FOLKLORE IN LITERATURE. (3)
A study of folk heroes, motifs, and ideas as they appear in the world's masterpieces. (Goodwyn)

CMLT 268. SEMINAR IN LITERARY SOURCES OF ART HISTORY. (3)
Second semester. Art historical sources from Pliny to Malraux. (Same as ART 268.) (Levitine)

CMLT 301. SEMINAR IN THEMES AND TYPES. (3)
First semester. Prerequisite, one year's graduate work in literature and the knowledge of one language other than English. Intensive study of fundamental motifs and trends in western literature. (Staff)

CMLT 399. THESIS RESEARCH. (1-6)
Arranged. (Staff)

COMPUTER SCIENCE

Director: ATCHISON.

The educational program in computer science is administered by the Computer Science Center which is an academic department of the University not affiliated with any particular school or college. This description of the program

is included in the catalog of the College of Arts and Sciences for the convenience of students and faculty of the College. The Computer Science Center provides computing service for all academic activities of the University and conducts an active research program in the computer and computer related sciences.

No Bachelor's degree program in computer science is offered at this University. The basic undergraduate courses are designed to offer students in all fields an introduction to the academic discipline concerned with the use of computers. The advanced undergraduate courses offer suitable preparation for graduate study in computer science or supporting work for students majoring in other areas. The Computer Science Center offers a Master of Science degree in computer science and also sponsors jointly with the Electrical Engineering Department a Master of Science degree program in Computer Systems Engineering. Undergraduate students interested in entering either of these graduate programs should consult an adviser as early in their preparation as possible.

The Student Chapter of the Association for Computing Machinery meets regularly for the discussion of topics in computer science which are of interest to undergraduates. Its programs are open to the public.

For Undergraduates

CMSC 005*. INTRODUCTION TO USE OF THE DIGITAL COMPUTER. (1)

An introduction to the use of FORTRAN for solution of simple computational tasks. The use of a conversational mode to simplify the computational process will be emphasized. Where possible students will be assigned to sections of comparable background. Examples and problems for the sections will be chosen appropriate to the background of the students.

CMSC 012. INTRODUCTORY ALGORITHMIC METHODS. (3)

Two lectures and one two-hour laboratory period per week. Prerequisite, MATH 011 or equivalent. Recommended for students not majoring in mathematics, the physical sciences, or engineering. Study of the algorithmic approach in the analysis of problems and their computational solution. Definition and use of a particular algorithmic language. Computer projects based on elementary algebra and probability; linear equations and matrices; and the ordering, searching, sorting, and manipulating of data.

CMSC 020. ELEMENTARY ALGORITHMIC ANALYSIS. (3)

Two lectures and one two-hour laboratory period per week. Pre- or co-requisite, MATH 020 or equivalent. Recommended for students majoring in mathematics, the physical sciences or engineering. Concept and properties of an algorithm, language and notation for describing algorithms, analysis of computational problems and development of algorithms for their solution, use of specific algorithmic languages in solving problems from numerical mathematics, completion of several projects using a computer.

CMSC 021. NUMERICAL CALCULUS LABORATORY I. (1 or 2)

Two hours laboratory per week for each credit hour. Prerequisite, MATH 021 or concurrent registration therein and CMSC 020, or equivalents. Laboratory work in the development of algorithmic solutions of problems taken from numerical calculus with emphasis on efficiency of computation, and the control of errors. Basic one-credit laboratory includes completion of several machine projects on material related to MATH 021. Second credit involves more comprehensive projects based on similar or related material.

*Being proposed

CMSC 022. NUMERICAL CALCULUS LABORATORY II. (1 or 2)

Two hours laboratory per week for each credit hour. Prerequisite, MATH 022 or concurrent registration therein and CMSC 020, or equivalents. Laboratory work in the development of algorithmic solutions of problems taken from numerical linear algebra with emphasis on efficiency of computation and the control of errors. Basic one credit laboratory includes completion of several machine projects on material related to MATH 022. Second credit involves more comprehensive projects based on similar or related material.

*For Advanced Undergraduates and Graduates***CMSC 100. LANGUAGE AND STRUCTURE OF COMPUTERS. (3)**

Two lectures and one two-hour laboratory period per week. Prerequisite, CMSC 012 or CMSC 020 or equivalent. Logical basis of computer structure, machine representation of numbers and characters, flow of control, instruction codes, arithmetic and logical operations, indexing and indirect addressing, input-output, push-down stacks, symbolic representation of programs and assembly systems, subroutine linkage, macros, interpretive systems, and recent advances in computer organization. Several computer projects to illustrate basic concepts.

NOTE: CMSC 100 may not be counted for credit in the graduate program in computer science.

CMSC 102. INTRODUCTION TO DISCRETE STRUCTURES. (3)

Prerequisite, CMSC 020 or equivalent. This is the same course as ENEE 102. Review of set algebra including relations, partial ordering and mappings. Algebraic structures including semigroups and groups. Graph theory including trees and weighted graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computer science and computer engineering.

NOTE: CMSC 102 may not be counted for credit in the graduate program in computer science.

CMSC 110. SPECIAL COMPUTATIONAL LABORATORY. (1 or 2)

Two hours laboratory per week for each credit hour. Prerequisite, CMSC 012 or equivalent. Arranged for special groups of students to give experience in developing algorithmic solutions of problems or using particular computational systems. May be taken for cumulative credit up to a maximum of six hours where different material is covered.

NOTE: CMSC 110 may not be counted for credit in the graduate program in computer science.

CMSC 140. STRUCTURE OF PROGRAMMING LANGUAGES. (3)

Prerequisite, CMSC 100 or equivalent. Formal definition of languages including specification of syntax and semantics. Syntactic structure and semantics of simple statements including precedence, infix, prefix, and postfix notation. Global structure and semantics of algorithmic languages including declarations and storage allocation, grouping of statements and binding time of constituents, subroutines, coroutines, tasks and parameters. List processing and data description languages.

CMSC 150. DATA AND STORAGE STRUCTURES. (3)

Prerequisite, CMSC 100 and CMSC 102 or equivalent. A study of intrinsic structures of data, such as arrays, strings, trees, and lists, and their relation to storage media. Representation of data structures in storage by records, files, etc. Special storage structures such as content addressed, trie, and associative

memories. Referencing, processing, and management techniques based on the structuring, e.g., list processing. Storage and accessing efficiency, as well as dynamic flexibility of various methods.

CMSC 166. FUNCTIONAL ORGANIZATION OF DIGITAL COMPUTER SYSTEMS. (3)

Prerequisite, CMSC 100 or ENEE 162 or equivalent. This is the same course as ENEE 166. Computer organization and configuration; inter-connection of sub-units into a computer system; arithmetic logic; storage structure and logic; control and sequencing; input-output systems. A small computer and a modern large-scale computer system will be used to illustrate these concepts. Each student will be expected to complete a project.

CMSC 190. SPECIAL PROBLEMS IN COMPUTER SCIENCE. (1-3)

Prerequisite, permission of instructor. An individualized course designed to allow a student or students to pursue a specialized topic or project under the supervision of the senior staff. Credit according to work done.

For Graduates

CMSC 200. COMPUTER AND PROGRAMMING SYSTEMS. (3)

Prerequisites, CMSC 140, 150, and 166. Review of batch process programming systems, their components, operating characteristics, services and limitations. Concurrent processing of input-output and interrupt handling. Structure of multiprogramming systems for large-scale multiprocessor computers. Addressing techniques, storage allocation, file management, system accounting, and user-related services; command languages and the embedding of subsystems. Operating characteristics of large-scale systems.

CMSC 215. THEORY OF COMPUTATION. (3)

Prerequisites, CMSC 100 and 102 or equivalent. Introduction to Turing machines, Wang machines, Sheperdson-Sturgis and other machines. Godel numbering and unsolvability results, the halting problem, Post's correspondence problem, and relative uncomputability. Machines with restricted memory access, limited memory, and limited computing time. Complexity classification and recursive function theory. Models of computation including the relationship to algorithms and programming.

CMSC 225. COMPUTER APPLICATIONS TO THE PHYSICAL SCIENCES. (3)

Prerequisites, CMSC 100 and a graduate course in physical science. Applications of computers to numerical calculation, data reduction, and modeling in the physical sciences. Stress will be laid on the features of the applications which have required techniques not usually considered in more general contexts.

CMSC 230. SIMULATION OF COMPUTER ORGANIZATION. (3)

Prerequisite, CMSC/ENEE 166 or equivalent. Computer design language, algorithmic and symbolic designs of stored-program computer logic, simulation of the designed computer, machine language programming, design and construction of an assembler for the simulated computer, assembly language programming.

CMSC 235. MODELING AND SIMULATION OF PHYSICAL SYSTEMS. (3)

Prerequisite, CMSC 100 and a course in probability or mathematical statistics. Monte-Carlo and other methods of investigating models of interest to physical scientists. Generation and testing of random numbers. Probabilistic, deterministic and incomplete models.

CMSC 240. COMPILER CONSTRUCTION. (3)

Prerequisites, CMSC 102, 140, 150. Review of assembly, loading and execution of programs including macros, data types and statements, block structure and storage allocation, procedures and functions. Organization of a compiler including symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, and optimization techniques. Use of compiler writing languages and bootstrapping.

CMSC 245. FORMAL LANGUAGES AND SYNTACTIC ANALYSIS. (3)

Prerequisites, CMSC 102, 140, 150. Definition of formal grammars: arithmetic expressions and precedence grammars, context-free and finite-state grammars. Algorithms for syntactic analysis: recognizers, backtracking, operator precedence techniques. Semantics of grammatical constructs: reductive grammars, Floyd productions, simple syntactical compilation. Relationship between formal languages and automata.

CMSC 258. SEMINAR ON INFORMATION RETRIEVAL. (3)

Prerequisite, CMSC 100 or permission of instructor. This is the same course as LBSC 258. Discussion of basic constraints on communications, sensing and modulating rates, effects of constraints on structure and function of information storage and retrieval systems, models and analysis, aspects of automatic information retrieval. Term paper on subject of student's interest and instructor's approval.

CMSC 263. THEORY OF SEQUENTIAL MACHINES. (3)

Prerequisites, CMSC 102, and CMSC 100 or ENEE 162. This is the same course as ENEE 263. Definition and representation of finite automata and sequential machines, equivalence of states and machines, congruence and reduced machines, analysis and synthesis of machines, decision problems of finite automata, partitions and the substitution property, generalized and incomplete machines, semigroups and machines, and other selected topics.

CMSC 266. ALGORITHMIC NUMERICAL ANALYSIS. (3)

Prerequisites, CMSC 100 and MATH 170-171. A detailed study of problems which arise in the implementation of numerical analysis algorithms in a computer. Rounding and truncation error. Automatic error estimates using interval arithmetic and convergence theorems. Examples from linear algebra, differential equations, systems of nonlinear algebraic equations, minimization.

CMSC 280. ARTIFICIAL INTELLIGENCE. (3)

Prerequisites, CMSC 102 and MATH 100, or permission of instructor. Critical review of major developments in neuromimes and brain models, trainable devices, "self-organizing" systems. Representative applications to prediction, decision making, pattern recognition, natural language processing, theorem proving and game playing. Class and individual projects to illustrate basic concepts.

CMSC 285. COMPUTER PROCESSING OF PICTORIAL INFORMATION. (3)

Prerequisite, CMSC 150 or permission of instructor. Objective and subjective aspects of pictorial information. Picture quality and its assessment; image enhancement. Picture redundancy; quantization, encoding and approximation of pictures. Picture description and pictorial pattern recognition. Input and output of pictorial information. Computer projects illustrating typical processing techniques as applied to black-and-white images.

CMSC 290. ADVANCED TOPICS IN COMPUTER SCIENCE. (3)

Prerequisite, permission of instructor. Advanced topics selected by the faculty

from the literature of computer science to suit the interest and background of students. May be taken for repeated credit.

CMSC 295. GRADUATE SEMINAR IN COMPUTER SCIENCE. (1-3)

Prerequisite, permission of instructor. Seminars are held on topics such as language design, translator theory, data systems, organization of computer systems, and automatic problem solving. May be taken for repeated credit.

CMSC 399. RESEARCH. (Arranged)

DANCE

Professor and Chairman: MADDEN.

Assistant Professor: ROSEN.

Instructors: LEVY, WAY (P.T.), WITT, AND YEO.

The Department of Dance offers courses to general students which serve to develop their knowledge of different cultures and arts by studying the role of dance in diverse societies and in relation to other art forms. Minors, supporting courses, and electives in dance, therefore, are also valuable to students majoring in such disciplines as sociology and anthropology as well as in music, art, and drama. For those students who major in dance, the Department provides courses of training which prepare them to practice their craft in concert or in the theatre, to pursue their studies of dance and related arts at the graduate level, or to become critics, historians, and archivists of dance.

A teacher certification program in dance is presently being developed in conjunction with the College of Education.

The available Bachelor of Arts degree is given by the College of Arts and Sciences and is awarded to those whose interest is basically in the cultural, performing, and composing aspects of the dance. The Department also offers courses which fulfill the Physical Education requirement.

Courses in dance theory, literature, and technique are open to all students who have completed the specified prerequisites, acquired the equivalent experience, or secured the permission of the Chairman of the Department of Dance. The Elementary Laboratory Group, the Apprentice Group, and the Dance Concert Group are also open to qualified students.

THE BACHELOR OF ARTS DEGREE

The Department requirement includes a core program of 14 hours in dance techniques and 24 hours in theory and literature. Dance majors are also required to take 12 hours in related disciplines.

No course with a grade of less than "C" may be applied toward the fulfillment of the course requirements for a major in dance.

DANC 032. INTRODUCTION TO DANCE. (3)

First and second semesters. Three lectures a week. A study of dance as a form of communication and as an art form. The course includes a survey of the theories and styles of dance, and of their relationships to other art forms. Lectures will be supplemented by observations, films, and guest speakers. May be taken to fulfill the 3 semester hours requirement in Fine Arts or Philosophy of the General Education requirement.

DANC 050. RHYTHMIC INVENTION FOR DANCE. (2)

First and second semester. Three hours a week. A course designed to show how rhythm affects the total dance movement picture and develops the dancer's rhythmic awareness and response. Understanding of rhythmic principles; movement isolation; design; phrasing; syncopation.

DANC 052, 054. DANCE TECHNIQUES. (2, 2)

First and second semesters. DANC 052, a study of dance movement in terms of placement, rhythm, dynamics, space, improvisation, and dance phrases. DANC 054, further development of the materials in DANC 052. Prerequisite, DANC 052 or equivalent.

DANC 055, 057. DANCE TECHNIQUES. (2, 2)

First and second semesters. Prerequisite, DANC 054 or equivalent. DANC 055, a study of dance techniques and styles. DANC 057, further development of materials in DANC 055. Prerequisite, DANC 055 or equivalent.

DANC 060. ELEMENTARY DANCE COMPOSITION. (3)

First and second semesters. Prerequisite, DANC 054 or equivalent. The study of basic principles of dance composition in terms of space, time, dynamics, and movement invention. The development of critical awareness and judgment with regard to composing.

DANC 070. INTERMEDIATE MODERN DANCE. (2)

First and second semesters. Prerequisite, DANC 060 or equivalent. Study of more advanced dance techniques and some compositional problems. May be repeated for credit.

DANC 080. ADVANCED MODERN DANCE. (2)

First and second semesters. Prerequisite, DANC 070 or equivalent. Continuation of DANC 070 in further advanced form. May be repeated for credit.

DANC 084. MOVEMENT FOR THE THEATRE. (3)

First and second semesters. Lecture and laboratory. Prerequisite, one semester of dance technique. Movement for actors, dancers, directors, singers in the theatre. Dynamics, qualities, styles, and space as related to movement on the stage.

DANC 090. WORKSHOP. (1-6)

First and second semesters. Admission by consent of instructor. Planning, choreography, and presentation of demonstrations and concerts. May be repeated for credit until 6 credits have been earned.

DANC 100. ADVANCED CHOREOGRAPHIC FORMS. (3)

First and second semesters. Prerequisite, DANC 060 or equivalent and adequate dance technique. Lectures and studio work in modern sources as they apply to dance. Solo and group choreography.

DANC 104. ETHNIC STYLES. (3)

First and second semesters. Prerequisite, DANC 054. Lecture and activity in styles expressive of various cultures. May be repeated for credit by permission of instructor.

DANC 114. DEVELOPMENT OF DANCE PROGRESSION. (3)

First and second semesters. Prerequisite, DANC 060 or equivalent. The application and building of dance progression both in terms of dance techniques and in choreographic studies. Students have the opportunity to observe and assist the instructor in conducting lower-level dance classes.

DANC 170. CREATIVE DANCE FOR CHILDREN. (3)

First and second semesters. Prerequisite, DANC 060 or equivalent. Directing the essential elements of dance to the level of the child's experience and facilitating the creative response. The development of movement into simple forms to serve as a symbol of individual expression.

DANC 180. DANCE PRODUCTION. (3)

First and second semesters. Prerequisites, DANC 100 or equivalent and an adequate understanding of dance techniques. Advanced choreography. Independent work with periodic criticism.

DANC 182, 183. HISTORY OF DANCE. (3, 3)

The development of dance from primitive to contemporary times and the relationship of dance forms to patterns of culture. DANC 182, the Primitive period through the Middle Ages; DANC 183, the Renaissance period to present times. May be taken to fulfill the 3 semester hours requirement in Fine Arts or Philosophy of the General Education requirement.

DANC 184. THEORY AND PHILOSOPHY OF DANCE. (3)

First and second semesters. The study of the theories, philosophies and aesthetics of dance. Investigation of form, content, and structure. Interrelationships of the arts, and their role in man's world. May be taken to fulfill the 3 semester hours requirement in Fine Arts or Philosophy of the General Education requirement.

DANC 190. NOTATION. (3)

First and second semesters. Prerequisite, DANC 050 or equivalent. Movement analysis for purposes of recording dance; notation fundamentals; elementary writing of technique; reading of simple folk, modern, and ballet studies.

DANC 192. PERCUSSION AND MUSIC SOURCES FOR DANCE. (3)

First and second semesters. Prerequisite, DANC 050 or equivalent. Techniques of percussion playing, and its use as dance accompaniment. Learning to use the instruments in composition and improvisation. Study of music sources for dance.

DANC 194. DIRECTED STUDIES IN DANCE. (1-6)

First and second semesters. Hours arranged. For advanced students who have the permission of the Chairman of the Department of Dance.

ECONOMICS

Students registered in the College of Arts and Sciences may major in economics. During the freshman and sophomore years prospective economics majors should consult with their lower division adviser in Arts and Sciences concerning preparation for the major. Normally ECON 004—Economic Developments (3) is taken during the freshman year and ECON 031, 032—Principles of Economics (3, 3) during the sophomore year. Economics majors are required to take six hours of mathematics.

Juniors and seniors are advised by the faculty of the Department of Economics, which is administered in the College of Business and Public Administration. In addition to the nine lower division credits listed above, economics majors must complete a minimum of 27 credits with an average grade of not less than "C." ECON 102—National Income Analysis (3); ECON 132—Advanced Economic Principles (3); and either BSAD 130—Business Statistics

I (3) or ECON 111—Quantitative Methods in Economics (3) are required. Other courses to meet the requirements of the major are to be selected with the aid of a faculty adviser. Descriptions of courses in economics will be found in the catalog of the College of Business and Public Administration. Additional information about the curriculum in economics may be obtained at the departmental office.

ENGLISH LANGUAGE AND LITERATURE

Professor and Chairman: FREEDMAN.

Associate Professor and Associate Chairman: LAWSON.

Professors: BODE, COOLEY, HARMAN (EMERITA), MANNING, McMANAWAY (P.T.), MISH, MURPHY, WHITTEMORE, ZEEVELD.

Visiting Professor: KORG.

Associate Professors: ANDREWS (EMERITA), BARNES, BROWN, COOPER, FLEMING, GRAVELY, HERMAN, HOVEY, JELLEMA, KINNAIRD, LAWSON, LUTWACK, McMILLAN, MYERS, PANICHAS, PITTS, PORTZ, SALAMANCA, G. SMITH, THORBERG, WARD, WEBER.

Assistant Professors: BIRDSALL, BROSNAHAN, BRYER, CAREY, CATE, COULTER, DUFFY, M. HOLTON, S. HOLTON, HOUPPERT, HOWARD, KENNEY, KLEINE, LOGAN, LOUNSBURY, MARTIN, ROBB, SALTZ, SCHAUMANN, D. SMITH, SPURGEON, VAN EGMOND, VITZTHUM, WALT, WILSON.

Visiting Lecturer: LUCAS.

Lecturers: ANDREADIS, LA VIA, ORR, REED.

Instructors: ALLEN, BASA, BATHURST, BEAUCHAMP, BENNETT, BLOXOM, BOJARSKI, BUHLIG, DeCATUR, DEMAREE, DIOMEDI (P.T.), DUNN, FELDMANN, FLOWER, FORMAN (P.T.), GADZIOLA, GIRLINGHOUSE, GREENWOOD, HORRELL, JAMES, J. O. JOHNSON, J. K. JOHNSON, JONES, KROME, LINDQUIST, MAYO-WELLS, MESZAROS, M. MILLER (P.T.), R. MILLER, PLYBON, RAMSEY, SCHMEISSNER, SQUIRES (P.T.), STEVENSON, STONE, TOWNSEND, TROUSDALE, WRIGHT.

The English major requires 30 credits, suitably distributed as indicated in Departmental announcements, beyond the General Education requirements. A student may pursue a major with emphasis in English, American, or Comparative Literature; in folklore, creative writing, or in linguistics; or in preparation for secondary school teaching.

No course with a grade less than "C" may be used to satisfy major requirements.

In selecting minor or elective subjects, students majoring in English, particularly those who plan to do graduate work, should give special consideration to courses in French, German, Latin, philosophy, and history.

HONORS

The Department of English offers an honors program, primarily for majors but open to others with the approval of the departmental honors committee. Interested students should ask for detailed information from an English Department adviser no later than the beginning of their junior year.

ENGL 001 or 021 is prerequisite to courses numbered 003 through 056.

ENGL 001. COMPOSITION. (3)

Required of freshmen. See ENGL 021. The study and application of rhetorical principles in expository prose; frequent themes. (Herman, Staff)

ENGL 021. HONORS COMPOSITION. (3)

May be elected by eligible students in place of ENGL 001 to satisfy General Education requirement. Survey of principles of composition, rhetoric, and techniques of research; reading in essays, short stories, poetry; frequent themes. (Thorberg, Staff)

ENGL 003. WORLD LITERATURE. (3)

Fulfills part of the General Education requirement. See ENGL 033. Homer to the Renaissance, foreign classics being read in translation. (McMillan, Staff)

ENGL 033. HONORS WORLD LITERATURE. (3)

May be elected by eligible students in place of ENGL 003 to satisfy general Education requirement. Homer to the Renaissance, foreign classics being read in translation. (McMillan, Staff)

ENGL 004. WORLD LITERATURE. (3)

Fulfills part of the General Education requirement. See ENGL 034. Shakespeare to the present, foreign classics being read in translation. (McMillan, Staff)

ENGL 034. HONORS WORLD LITERATURE. (3)

May be elected by eligible students in place of ENGL 004 to satisfy General Education requirement. Shakespeare to the present, foreign classics being read in translation. (McMillan, Staff)

ENGL 007. TECHNICAL WRITING. (2)

(Staff)

ENGL 008. INTRODUCTION TO ENGLISH GRAMMAR. (3)

A brief review of traditional English grammar, and an introduction to structural grammar, including phonology, morphology, and syntax. (Robb, James, Staff)

ENGL 009. INTRODUCTION TO NARRATIVE LITERATURE. (3)

Prerequisite, ENGL 001 or 021. An intensive study of representative stories, with lectures on the history and technique of the short story and other narrative forms. (Staff)

ENGL 010. COMPOSITION AND LITERARY TYPES. (3)

Not open to students who have taken ENGL 021. A study of literary genres with writing based on the readings. (Herman, Staff)

ENGL 012. INTRODUCTION TO CREATIVE WRITING. (3)

Additional prerequisite, sophomore standing and departmental permission. (Schaumann, Van Egmond, Staff)

ENGL 014. EXPOSITORY WRITING. (3)

(Herman, Staff)

ENGL 015. READINGS IN BIOGRAPHY. (3)

An analytical study in the form and technique of biographical writing in Europe and America. (Ward)

ENGL 030. INTRODUCTION TO POETRY AND POETICS. (3)

(G. Smith, Jellema)

ENGL 055. ENGLISH LITERATURE FROM THE BEGINNINGS TO 1800. (3)

May be elected by eligible students in place of ENGL 003 or 004 to satisfy the General Education requirement. (Cooper, Staff)

ENGL 056. ENGLISH LITERATURE FROM 1800 TO THE PRESENT. (3)

May be elected by eligible students in place of ENGL 003 or 004 to satisfy the General Education requirement. (Cooper, Staff)

For Advanced Undergraduates and Graduates

ENGL 003-004 (033-034) or 055-056 are prerequisites to courses numbered 101 through 199.

ENGL 101. HISTORY OF THE ENGLISH LANGUAGE. (3)

(Birdsall, Robb, S. Holton, James)

ENGL 102. OLD ENGLISH. (3)

(Brosnahan, S. Holton)

ENGL 104. CHAUCER. (3)

(Cooley, Brosnahan, McMillan, Birdsall)

ENGL 105. INTRODUCTION TO LINGUISTICS. (3)

Listed also as LING 101.

(Tuniks)

ENGL 107. AMERICAN ENGLISH. (3)

(Robb)

ENGL 108. ADVANCED ENGLISH GRAMMAR. (3)

Credit may not be granted in both ENGL 108 and LING 103.

(Robb, James)

ENGL 109. ENGLISH MEDIEVAL LITERATURE IN TRANSLATION. (3)

(Staff)

ENGL 110, 111. ELIZABETHAN AND JACOBAN DRAMA. (3, 3)

(Zeeveld, Houppert)

ENGL 112, 113. LITERATURE OF THE RENAISSANCE. (3, 3)

(Zeeveld, Cooper)

ENGL 115, 116. SHAKESPEARE. (3, 3)

(Zeeveld, Cooper, Houppert, D. Smith, Logan, Spurgeon)

ENGL 117. THE MAJOR WORKS OF SHAKESPEARE. (3)

(Staff)

ENGL 120. ENGLISH DRAMA FROM 1660 TO 1800. (3)

(Ward)

ENGL 121. MILTON. (3)

(Murphy, Freedman, Weber, Wilson)

ENGL 122. LITERATURE OF THE SEVENTEENTH CENTURY, 1600-1660. (3)

(Murphy, Mish, Wilson)

ENGL 123. LITERATURE OF THE SEVENTEENTH CENTURY, 1660-1700. (3)

(Wilson)

ENGL 125, 126. LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)

(Myers, Howard)

ENGL 129, 130. LITERATURE OF THE ROMANTIC PERIOD. (3, 3)

(Weber, Kinnaird, G. Smith)

ENGL 134, 135. LITERATURE OF THE VICTORIAN PERIOD. (3, 3)

(Brown, Pitts, Cate)

ENGL 139, 140. THE ENGLISH NOVEL. (3, 3)

(Ward, Kenney, Kleine)

ENGL 141, 142. MAJOR BRITISH WRITERS. (3, 3)

Two writers studied intensively each semester.

(Fleming, Panichas, Lucas, Jellema, Duffy)

ENGL 143. MODERN POETRY. (3)

(Fleming, Jellema)

- ENGL 144. MODERN DRAMA. (3)
(Freedman, Weber, Bryer)
- ENGL 145. THE MODERN NOVEL. (3)
(Panichas, Lawson, M. Holton)
- ENGL 146. AMERICAN DRAMA. (3)
(Bryer)
- ENGL 148. THE LITERATURE OF AMERICAN DEMOCRACY. (3)
(Barnes)
- ENGL 149. AMERICAN LITERATURE, BEGINNINGS TO 1810. (3)
(Vitzthum)
- ENGL 150. AMERICAN LITERATURE, 1810-1865. (3)
(Gravely, Barnes, Carey, Van Egmond, Vitzthum)
- ENGL 151. AMERICAN LITERATURE SINCE 1865. (3)
(Gravely, Barnes, Thorberg, Carey, M. Holton, Reed, Van Egmond)
- ENGL 152. THE NOVEL IN AMERICA TO 1910. (3)
(Hovey, Thorberg)
- ENGL 153. THE NOVEL IN AMERICA SINCE 1910. (3)
(Hovey, Thorberg)
- ENGL 154. LITERATURE OF THE SOUTH. (3)
A historical survey, from eighteenth-century beginnings to the present.
(Lawson)
- ENGL 155, 156. MAJOR AMERICAN WRITERS. (3, 3)
Two writers studied intensively each semester.
(Manning, Gravely, Lutwack, Barnes, M. Holton, Bryer)
- ENGL 157. INTRODUCTION TO FOLKLORE. (3)
(McMillan, Birdsall, Carey)
- ENGL 158. FOLK NARRATIVE. (3)
Studies in legend, tale, and myth.
(McMillan, Birdsall)
- ENGL 159. FOLKSONG AND BALLAD. (3)
(McMillan, Carey)
- ENGL 160. ADVANCED EXPOSITORY WRITING. (3)
(Herman, Walt, Trousdale, Horrell, Stevenson)
- ENGL 170. CREATIVE WRITING. (3)
(Fleming, Jellema, M. Holton)
- ENGL 171. ADVANCED CREATIVE WRITING. (3)
(Fleming, Salamanca)
- ENGL 172. PLAYWRITING. (3)
(Fleming)
- ENGL 190, 191. HONORS CONFERENCE AND READING. (1, 1)
Second semester. Prerequisite, candidacy for honors in English. Candidates will take ENGL 190 in their junior year and ENGL 191 in their senior year.
(Staff)
- ENGL 199. SENIOR PRO-SEMINAR IN LITERATURE. (3)
Open only to seniors. First semester. Required of candidates for honors and strongly recommended to those who plan to do graduate work. Individual reading assignments; term paper.
(Staff)

For Graduates

- ENGL 201. BIBLIOGRAPHY AND METHODS. (3)
(Hovey, Pitts, Bryer, D. Smith, Houppert)
- ENGL 202. MIDDLE ENGLISH. (3)
(Brosnahan)

- ENGL 204. SEMINAR IN MEDIEVAL LITERATURE. (3)
(Cooley, Brosnahan)
- ENGL 206, 207. SEMINAR IN RENAISSANCE LITERATURE. (3, 3)
(McManaway, Zeeveld, Mish)
- ENGL 210, 211. SEMINAR IN SEVENTEENTH-CENTURY LITERATURE. (3, 3)
(Mish, Freedman, Wilson)
- ENGL 212, 213. SEMINAR IN EIGHTEENTH-CENTURY LITERATURE. (3, 3)
(Myers)
- ENGL 214, 215. SEMINAR IN NINETEENTH-CENTURY LITERATURE. (3, 3)
(Brown, Kinnaird, Pitts, G. Smith)
- ENGL 216, 217. LITERARY CRITICISM. (3, 3)
(Lutwack)
- ENGL 218. SEMINAR IN LITERATURE AND THE OTHER ARTS. (3)
(Myers)
- ENGL 225, 226. SEMINAR IN AMERICAN LITERATURE. (3, 3)
(Bode, Hovey, Lutwack, Lawson)
- ENGL 227, 228. PROBLEMS IN AMERICAN LITERATURE. (3, 3)
(Staff)
- ENGL 230. SPECIAL STUDIES IN ENGLISH LITERATURE TO 1600. (3)
(Cooley, Cooper)
- ENGL 232. SPECIAL STUDIES IN ENGLISH LITERATURE, 1600-1800. (3)
(Mish, Murphy, Myers, Wilson)
- ENGL 235. SPECIAL STUDIES IN NINETEENTH-CENTURY ENGLISH LITERATURE. (3)
(Brown, G. Smith, Kinnaird)
- ENGL 237. SPECIAL STUDIES IN AMERICAN LITERATURE. (3)
(Lutwack, Hovey)
- ENGL 241, 242. STUDIES IN TWENTIETH-CENTURY LITERATURE. (3, 3)
(Bode, Hovey, Panichas, Jellema, Lucas, Kleine)
- ENGL 244. STUDIES IN DRAMA. (3)
(Freedman)
- ENGL 245. STUDIES IN FICTION. (3)
(Mish)
- ENGL 257. SEMINAR IN FOLKLORE. (3)
(McMillan)
- ENGL 399. THESIS RESEARCH. (1-6)
Arranged. (Staff)

FOREIGN LANGUAGES AND LITERATURES

General Information

MAJORS

Two types of undergraduate majors are offered in French, German, Russian or Spanish: one for the general student or the future teacher, and the other for those interested in a rounded study of a foreign area for the purpose of under-

standing another nation through its literature, history, sociology, economics, and other aspects. Both of these majors confer the B.A. degree. (The Department also offers M.A. and Ph.D. degrees in language and literature, but not in area study.)

An undergraduate major in either language and literature or area studies requires a total of 33 hours, with a "C" average, above the basic Arts and Sciences College foreign language requirement.

LANGUAGE AND LITERATURE MAJOR

Course 011 is prerequisite to this major unless waived by the Chairman of the Department. Specific minimum requirements in the program in French, German, and Spanish are: three semester courses in advanced language (two to be selected from Courses 012, 080, 081 and one from Courses 103, 104); two semesters of the survey of literature (Courses 075, 076; or 077, 078); four semester courses selected from literature courses numbered 100 to 199; and two semester courses in literature numbered 100 to 199 in addition to the required four semester courses selected from this group, or two semester courses in English or Comparative Literature courses numbered 101 to 157, or one semester course from the former group and one from the latter—a total of 33 hours. Requirements for a language major in Russian comprise: three semesters of advanced Russian (Courses 012 or 013; 071 or 072; and 080 or 081), plus two semesters of the survey of literature, Russian 075 and 076; four semesters in 100-level courses; and two semester courses numbered 103 to 142 in addition to the required four semester courses selected from this group, or two semester courses in English or Comparative Literature courses numbered 101 to 157, or one semester course from the former group and one from the latter—a total of 33 hours.

FOREIGN AREA MAJOR

The area study major in French, German, Russian, or Spanish endeavors to provide the student with a knowledge of the various aspects of the country whose language he is studying. Specific requirements in this major are: five semester courses in advanced language (Courses 012, 071, 072, 080, 081); two semester courses in civilization (Courses 171, 172; or 173, 174); two semester courses in literature numbered 100 to 199; and two semester courses in literature numbered 100 to 199 in addition to the required two semester courses selected from this group, or two semester courses in English or Comparative Literature courses numbered 101 to 157, or one semester course from the former group and one from the latter—a total of 33 hours.

HONORS IN FRENCH, GERMAN OR SPANISH

A student whose major is in French, German, or Spanish and who, at the time of application, has a general academic average of 3.0 to 3.5 in his major field, may apply to the Chairman of the Honors Committee for admission to the Honors Program of the Department. Honors work normally begins in the first semester of the junior year, but a qualified student may enter as early as the sophomore year or as late as the second semester of the junior year. Honors students are required to take two courses from those numbered 195,

196, 197 and the seminar numbered 199, as well as to meet other requirements for a major in Foreign Languages. There will be a final comprehensive examination, covering the honors reading list, which must be taken by all graduating seniors who are candidates for honors. Admission of students to the Honors Program, their continuance in the program, and the final award of honors are the prerogative of the Departmental Honors Committee.

ELEMENTARY HONORS

Course 003 in French, German, and Spanish is limited to specially approved candidates who have passed Course 001 with high grades, and will allow them to by-pass Course 006 to complete their requirement by completing Course 007.

LOWER DIVISION COURSES

At the beginning of each semester a placement examination is given for those students who wish to continue in the University in a foreign language which they have studied for two or more years in high school (French, German, Spanish).^{*} Such students have the option of enrolling in Course 005 or taking a placement examination. Students with two or more years of high school language may not take Course 001 or 002 in that language for credit unless there has been a four year lapse of time between their last high school course in that language and the date of their matriculation at the University. Students with only one year of high school language may take Course 001 and 002 in that language for credit. Students with two or more years of high school language who place in Course 005 must complete, in addition to 005, Courses 006 and 007; those who place in 006 must complete, in addition to 006, Course 007; those who place in 007 must complete Course 007 or its equivalent. Students who place higher than 007 thereby fulfill by examination the College language requirement. In German the course sequence is 005, 006, 007, 008, 011, and 012. Neither German 011 nor 012 may be taken to meet the College requirement unless the student has completed German 007.

Transfer students with college credit have the option of continuing at the level for which they are theoretically prepared, or of taking a placement examination, or of electing Course 005. If a transfer student takes Course 005 for credit, he may retain transfer credit *only* for the equivalent of Course 001. A transfer student placing lower than his training should warrant may ignore the placement but DOES SO AT HIS OWN RISK.

If a student has received a "D" in a course, advanced and completed the next higher course, he cannot go back and repeat the original "D."

No credit will be given, even elective, for a single semester of language 001.

A student whose native language is taught at the University may not meet the college requirement by taking Courses 001, 002, 006, 007, 080 and 081. There is a special option by which foreign students may offer a combination of FOLA 001 and 002 (English for Foreign Students) and 12 hours of other English courses to satisfy both the Arts and Sciences English and Foreign Language requirements. This option may not be used by pre-medical students.

^{*}Students who have studied Chinese, Italian, or Russian may apply to the Department for special examination, since there is no Course 005, in these languages, and all students who have studied Hebrew must take a placement examination.

The Civilization courses (171, 172) cannot be used toward the foreign language requirement except by students who *begin* language at the University with a fifth semester course (008) or higher.

SPECIAL COURSES FOR FOREIGN STUDENTS

FOLA 001-002. ENGLISH FOR FOREIGN STUDENTS. (3, 3)

An introduction to English usage, adapted to the needs of the non-English-speaking student. Pronunciation, spelling, syntax; the differences between English and various other languages are stressed. (Bridgers)

CHINESE PROGRAM

Assistant Professor: McCASKEY. (*Director*)

Lecturer: SHEN.

CHIN 001-002. ELEMENTARY CHINESE. (3, 3)

Three recitations and one laboratory period per week. Elements of pronunciation, simple ideograms, colloquial conversation, translation. (Shen)

CHIN 006-007. INTERMEDIATE CHINESE. (3, 3)

Three recitations per week; additional electronic laboratory in CHIN 006. Prerequisite, CHIN 002 or equivalent. Reading of texts designed to give some knowledge of Chinese life, thought, and culture. (McCaskey)

CHIN 101-102. READING FROM CHINESE HISTORY. (3, 3)

Prerequisite, CHIN 007 or equivalent. Based on an anthology of historians from the Chou to the Ching dynasties. (McCaskey)

CHIN 117-118. CHINESE LINGUISTICS. (3, 3)

Prerequisite, CHIN 007 or equivalent. (Shen)

CHIN 171-172. CHINESE CIVILIZATION. (3, 3)

This course supplements GEOG 134 and 135, *Cultural Geography of East Asia*. It deals with Chinese literature, art, folklore, history, government, and great men. Second semester: developments in China since 1911. The course is given in English translation. (McCaskey)

HEBREW PROGRAM

Assistant Professor: GREENBERG.

HEBR 001-002. ELEMENTARY HEBREW. (3, 3)

Elements of grammar; pronunciation and conversation; exercises in translation. (Greenberg)

HEBR 006-007. INTERMEDIATE HEBREW. (3, 3)

Three recitations per week; additional electronic laboratory in HEBR 006. Prerequisite, HEBR 002 or equivalent. Texts designed to give some knowledge of Hebrew life, thought, and culture. (Greenberg)

HEBR 012-013. CONVERSATION AND COMPOSITION. (3, 3)

Prerequisite, HEBR 007 or equivalent. A practical language course recommended for all students continuing with Hebrew. (Greenberg)

- HEBR 075-076. SURVEY OF HEBREW LITERATURE. (3, 3)
Prerequisite, HEBR 007 or equivalent. (Greenberg)
- HEBR 101. THE HEBREW BIBLE. (3)
Reading of selected portions of the Pentateuch. (Greenberg)
- HEBR 102. THE HEBREW BIBLE. (3)
Reading of selected portions of the Prophets. (Greenberg)
- HEBR 103. MODERN HEBREW LITERATURE. (3)
The period of the Haskalah (Enlightenment). (Greenberg)
- HEBR 104. MODERN HEBREW LITERATURE. (3)
The period of the Tehiah (Modern Revival). (Greenberg)

FRENCH AND ITALIAN LANGUAGES AND LITERATURES

Professor and Chairman: MACBAIN.

Associate Professor and Assistant Chairman: HALL.

Professors: BINGHAM, QUINN, AND ROSENFELD.

Associate Professor: DEMAIRE.

Assistant Professors: BRIDGERS, FINK, LAMARQUE, LLOYD-JONES, VASSYLKIVSKY, AND ZIMMERMAN.

Lecturers: JOHNSON AND MEYER.

Instructors: BEIQUE, CHRISTOV, EARDLEY, EDMONDS, GILBERT, GRAY, GUIEU, JOHNSON, LEBRETON-SAVIGNY, LONG, LUIGGI, LUNDY, MEYER, MOTTA, POWELL, RAY, RUSSELL, AND WEIL-MALHERBE.

FRENCH

FREN 000. ELEMENTARY FRENCH FOR GRADUATE STUDENTS. (AUDIT)
Intensive elementary course in the French language designed particularly for graduate students who wish to acquire a reading knowledge. (Staff)

FREN 001-002. ELEMENTARY FRENCH. (3, 3)
Each semester; given as intensive course in summer session. Three recitations and one drill per week. Study of spoken and written language and development of the four language skills. (Meyer, Staff)

FREN 003H. ELEMENTARY FRENCH, HONORS COURSE. (3)
Two recitations and two audio-lingual drills per week. Enrollment limited to specially approved candidates from FREN 001. Students taking this course will normally continue in FREN 007. (Staff)

FREN 005. REVIEW OF ELEMENTARY FRENCH. (3)
Two recitations and two audio-lingual drills per week, or three recitations and one audio-lingual drill, depending on circumstances. Enrollment limited to students who, having taken placement examination, have failed to qualify for FREN 006. (Gray, Staff)

FREN 006-007. INTERMEDIATE FRENCH. (3, 3)
Three recitations per week; additional electronic laboratory in FREN 006. Given as intensive course in summer session. Prerequisite, FREN 002 or equivalent, or FREN 005, except that recommended students may enter FREN

007 from FREN 003. Study of linguistic structure, further development of audio-lingual and writing ability, and reading of literary texts with discussion in French. Usually there will be an honors section for qualified students.

(Johnson)

FREN 010. SCIENTIFIC FRENCH. (3)

Prerequisite, FREN 006. Reading of technical and scientific prose with some attention to audio-lingual and linguistic objectives.

(Johnson)

FREN 011. INTRODUCTION TO FRENCH LITERATURE. (3)

Prerequisite, FREN 007. Required of all students who continue in advanced courses of the Department, with the exception of superior students who are permitted to by-pass an introduction to French literature. May be taken concurrently with FREN 012.

(Fink)

FREN 012. CONVERSATION AND COMPOSITION. (3)

Prerequisite, FREN 007. A practical language course recommended for all students continuing in French. May be taken concurrently with FREN 011.

(Meyer)

For Advanced Undergraduates

FREN 041. FRENCH PHONETICS. (3)

Prerequisite, FREN 007 or equivalent. Elements of French phonetics, diction and intonation.

(Gray)

FREN 071-072. REVIEW GRAMMAR AND COMPOSITION. (3, 3)

Prerequisite, FREN 011 and 012 or equivalent. For students who, having a good knowledge of French, wish to become more proficient in the written and spoken language.

(Zimmerman)

FREN 075-076. SURVEY OF FRENCH LITERATURE. (3, 3)

Prerequisite, FREN 011 or equivalent. An elementary survey of the chief authors and movements in French literature. To be taken in sequence.

(Cap)

FREN 080-081. ADVANCED CONVERSATION. (3, 3)

Prerequisite, FREN 011 and 012 or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. To be taken in sequence.

(Meyer, Fink)

For Advanced Undergraduates and Graduates

FREN 101. APPLIED LINGUISTICS. (3)

The nature of Applied Linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and French, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills.

(Mendeloff)

FREN 103. ADVANCED COMPOSITION. (3)

Study of word formation, specialized vocabularies, idiomatic constructions, review of certain points of grammar, translation from English to French, and free composition.

(Cap)

FREN 104. EXPLICATION DE TEXTES. (3)

Oral and written analysis of short literary works, or of excerpts from longer works chosen for their historical, structural, or stylistic interest, with the purpose of training the major to understand literature in depth and to make mature esthetic evaluations of it.

(Cap)

- FREN 107. INTRODUCTION TO MEDIEVAL LITERATURE. (3)**
 French literary history from the ninth through the fifteenth century, selected readings from representative texts. (Mendeloff)
- FREN 111-112. FRENCH LITERATURE OF THE SIXTEENTH CENTURY. (3, 3)**
 The Renaissance in France: Humanism, Rabelais, Calvin, the Pleiade, Montaigne, Baroque poetry. (Donaldson-Evans)
- FREN 115-116. FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. (3, 3)**
 First semester: Descartes, Pascal, Corneille, Racine. Second semester: the remaining great classical writers, with special attention to Moliere. (Goode)
- FREN 125-126. FRENCH LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)**
 First semester: development of the philosophical and scientific movement; Montesquieu. Second semester: Voltaire, Diderot, Rousseau. (Fink)
- FREN 131-132. FRENCH LITERATURE OF THE NINETEENTH CENTURY. (3, 3)**
 First semester: drama and poetry from Romanticism to Symbolism. Second semester: the major prose writers of the same period. (Zimmerman)
- FREN 141-142. FRENCH LITERATURE OF THE TWENTIETH CENTURY. (3, 3)**
 First semester: drama and poetry from Symbolism to the present time. Second semester: the contemporary novel. (Demaitre)
- FREN 171-172. FRENCH CIVILIZATION. (3, 3)**
 French life, customs, culture, traditions. First semester: the historical development. Second semester: present-day France. (Cap)
- FREN 181-182. PRO-SEMINAR IN GREAT LITERARY FIGURES. (3, 3)**
 Each semester a specialized study will be made of one great French writer chosen from some representative literary period or movement since the middle ages. (Staff)
- FREN 195H, 196H, 197H. HONORS READING COURSE. (3, 3, 3)**
 Supervised readings to be taken normally only by students admitted to the Honors Program: 195 is poetry; 196 is the novel; 197 is drama. (Staff)
- FREN 199H. HONORS SEMINAR. (3)**
 Required of all students in the Honors Program. Other students will be admitted on special recommendation. Conducted in French. Discussion of a central theme with related investigations by students. (Staff)

For Graduates

The requirements of students will determine which courses will be offered.

- FREN 201. THE HISTORY OF THE FRENCH LANGUAGE. (3)**
 (Mendeloff)
- FREN 203. COMPARATIVE ROMANCE LINGUISTICS. (3)**
 Same as Spanish 203. (Mendeloff)
- FREN 207. ELEMENTARY OLD FRENCH. (3)**
 (Mendeloff)
- FREN 208. OLD FRENCH PHONOLOGY AND MORPHOLOGY. (3)**
 (Staff)
- FREN 209. MEDIEVAL FRENCH CULTURE. (3)**
 (Staff)
- FREN 210. ELEMENTARY OLD PROVENÇAL. (3)**
 (Staff)

- FREN 213-214. SEMINAR IN FRENCH RENAISSANCE. (3, 3)
(Donaldson-Evans)
- FREN 215-216. SEMINAR IN MOLIERE. (3, 3)
(Quynn)
- FREN 218-219. SEMINAR IN FRENCH CLASSICISM. (3, 3)
(Quynn)
- FREN 220-221. THE AGE OF ENLIGHTENMENT. (3, 3)
(Bingham)
- FREN 230. SEMINAR IN ROMANTICISM. (3)
(Quynn)
- FREN 231. SEMINAR IN NINETEENTH CENTURY POST-ROMANTIC WRITERS. (3, 3)
(Zimmerman)
- FREN 235-236. THE REALISTIC NOVEL IN THE NINETEENTH CENTURY. (3, 3)
(Staff)
- FREN 243-244. THE CONTEMPORARY FRENCH THEATER. (3, 3)
(Staff)
- FREN 245-246. SEMINAR IN THE CONTEMPORARY NOVEL. (3, 3)
(Staff)
- FREN 251-252. THE HISTORY OF IDEAS IN FRANCE. (3, 3)
(Rosenfield)
- FREN 253. PROBLEMS IN BIBLIOGRAPHY AND RESEARCH METHODS. (3)
Purpose and use of reference works and other sources for scholarly studies;
types and methods of literary research. (Bingham)
- FREN 261-262. SEMINAR IN A GREAT LITERARY FIGURE. (3, 3)
(Staff)
- FREN 271-272. ADVANCED WRITING AND STYLISTICS. (3, 3)
(Staff)
- FREN 281-282. READING COURSE. (3, 3)
(Staff)
- FREN 291-292. SEMINAR. (3, 3)
Topic to be determined each semester. (Staff)
- FREN 399. RESEARCH. (1-6)
Credits determined by work accomplished. Guidance in the preparation of
master's and doctoral theses. Conferences. (Staff)

ITALIAN

- ITAL 001-002. ELEMENTARY ITALIAN. (3, 3)
Three recitations and one laboratory hour per week. Elements of grammar
and exercises in translation. (Motta)
- ITAL 003H. ELEMENTARY ITALIAN, HONORS COURSE. (3)
Three recitations and one drill per week. Enrollment limited to specially ap-
proved candidates from ITAL 001. Students taking this course will normally
continue in ITAL 007. (Motta)
- ITAL 006-007. INTERMEDIATE ITALIAN. (3, 3)
Three recitations per week; additional electronic laboratory in ITAL 006.
Prerequisite, ITAL 002 or equivalent. Reading of texts designed to give some
knowledge of Italian life, thought, and culture. (Motta)
- ITAL 011. INTRODUCTION TO ITALIAN LITERATURE. (3)
Prerequisite, ITAL 007. Required of all students who continue in advanced

courses of the Department with the exception of superior students who are permitted to by-pass an introduction to Italian literature. Conducted in Italian. Reading of literary texts, discussion and brief essays. Fall semester only.

(Motta)

ITAL 012. CONVERSATION AND COMPOSITION. (3)

Prerequisite, ITAL 007. A practical language course recommended for all students continuing in Italian. May be taken concurrently with ITAL 011. Spring semester only.

(Motta)

ITAL 075-076. SURVEY OF ITALIAN LITERATURE. (3, 3)

Prerequisite, ITAL 007 or equivalent. Basic survey of history of Italian literature.

(Motta)

SPANISH AND PORTUGUESE LANGUAGES AND LITERATURES

Professor and Chairman: HESSE.

Professor and Assistant Chairman: PARSONS.

Professors: GOODWYN, GRAMBERG, MENDELOFF, AND NEMES.

Visiting Professor: MARRA-LOPEZ.

Associate Professor: ROVNER.

Assistant Professors: J. CAGIGAO, KELLY, NORTON, AND PANICO.

Instructors: I. CAGIGAO, ENTENZA, FONT, FORBES, MUR, NAVARRETE, RENTZ, SCHEIDERER, SUSZYNSKI, THORPE, VILLAVICENCIO, AND WILLOUGHBY-MACDONALD.

SPANISH

SPAN 001-002. ELEMENTARY SPANISH. (3, 3)

Each semester; given as intensive course in summer session. Three recitations and one laboratory hour per week. Study of linguistic structure and development of audio-lingual and writing ability.

(Rovner, Staff)

SPAN 003H. ELEMENTARY SPANISH, HONORS COURSE. (3)

Three recitations and one laboratory hour per week. Enrollment limited to specially approved candidates from SPAN 001. Students taking this course will normally continue in SPAN 007.

(Rovner)

SPAN 005. REVIEW OF ELEMENTARY SPANISH. (3)

Three recitations and one laboratory hour per week. Enrollment limited to students who, having taken the placement examination, have failed to qualify for SPAN 006.

(Rentz, Staff)

SPAN 006-007. INTERMEDIATE SPANISH. (3, 3)

Three recitations per week; additional electronic laboratory in SPAN 006. Given as intensive course in summer session. Prerequisite, SPAN 002 or equivalent, or SPAN 005, except that recommended students may enter SPAN 007 from SPAN 003. Study of linguistic structure, further development of audio-lingual and writing ability, and reading of literary texts with discussion in Spanish. Usually there will be an honors section for qualified students.

(Font, Armstrong)

SPAN 011. INTRODUCTION TO SPANISH LITERATURE. (3)

Prerequisite, SPAN 007. Required of all students who continue in advanced courses of Department, with the exception of superior students who are permitted to by-pass an introduction to Spanish literature. Conducted in Spanish. Reading of literary texts, discussion, and brief essays. (Suszynski)

SPAN 012. REVIEW OF ORAL AND WRITTEN SPANISH. (3)

Prerequisite, SPAN 007. A practical language course recommended for all students continuing in Spanish. May be taken concurrently with SPAN 011. (LeVine)

*For Advanced Undergraduates***SPAN 041-042. SPANISH PHONETICS. (1, 1)**

Prerequisite, SPAN 007 or equivalent. Descriptive study of the Spanish sound system. Practice in phonetic perception, transcription and articulation. Particular attention to sentence phonetics; juncture, rhythm, stress, pitch. (Mendeloff)

SPAN 051-052. COMMERCIAL SPANISH. (3, 3)

Prerequisite, SPAN 012 and consent of instructor. Designed to give a knowledge of correct Spanish usage, commercial letters and business forms. Fundamental principles of Spanish shorthand will be included if warranted by the interest and ability of the class. (Rovner, Mur)

SPAN 071-072. REVIEW GRAMMAR AND COMPOSITION. (3, 3)

Prerequisite, SPAN 011 and 012 or equivalent. Intended to give an intensive and practical drill in Spanish composition. (Panico)

SPAN 075-076. SURVEY OF SPANISH LITERATURE. (3, 3)

Prerequisite, SPAN 011 or equivalent. Basic survey of the history of Spanish literature. (Panico)

SPAN 077-078. SURVEY OF SPANISH-AMERICAN LITERATURE. (3, 3)

Prerequisite, SPAN 011 or equivalent. Basic survey of the history of Spanish-American literature. (Panico)

SPAN 080-081. ADVANCED CONVERSATION. (3, 3)

Prerequisite, SPAN 011 and 012 or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. (Staff)

*For Advanced Undergraduates***SPAN 101. APPLIED LINGUISTICS. (3)**

Nature of Applied Linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and Spanish with emphasis upon points of divergence. Analysis, evaluation, and construction of related drills. (Mendeloff)

SPAN 103-104. ADVANCED COMPOSITION. (3, 3)

Free composition, literary translation, and practical study of syntactical structure. (Panico)

SPAN 105. GREAT THEMES OF THE HISPANIC LITERATURES. (3)

(Nemes, Staff)

SPAN 107. INTRODUCTION TO MEDIEVAL LITERATURE. (3)

Spanish literary history from the eleventh through the fifteenth century. Selective readings from representative texts. (Mendeloff, Parsons)

- SPAN 111-112. PROSE AND POETRY OF THE SIXTEENTH CENTURY. (3, 3)
Selected readings and literary analysis. (Goodwyn, Staff)
- SPAN 113. DRAMA OF THE SIXTEENTH CENTURY. (3)
From the earliest *autos* and *pasos*, the development of Spanish drama anterior to Lope de Vega, including Cervantes. (Rovner)
- SPAN 115-116. CERVANTES: NOVELAS EJEMPLARES AND DON QUIXOTE.
(Goodwyn)
- SPAN 117-118. PROSE AND POETRY OF THE SEVENTEENTH CENTURY. (3, 3)
Selected readings, literary analysis, and discussion of the outstanding prose and poetry of the period, in the light of the historical background. (Goodwyn)
- SPAN 119-120. DRAMA OF THE SEVENTEENTH CENTURY. (3, 3)
First semester devoted to Lope de Vega, dramatic theory, and the Spanish stage. Second semester: drama after Lope de Vega to Calderon de la Barca and the decay of the Spanish theater. (Rovner)
- SPAN 125-126. LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)
Traditionalism, neo-classicism, and pre-Romanticism in prose, poetry, and the theater; esthetics and poetics of the enlightenment. Recommended primarily for graduate students. Undergraduates by consent of the instructor. (Staff)
- SPAN 130. THE ROMANTIC MOVEMENT IN SPAIN. (3)
Poetry, prose and drama of the Romantic and post-Romantic periods. (Gramberg)
- SPAN 131. NINETEENTH CENTURY FICTION. (3)
Significant novels of the nineteenth century. (Gramberg)
- SPAN 133-134. MODERNISM AND POST-MODERNISM IN SPAIN AND SPANISH AMERICA. (3, 3)
A study of the most important works and authors of both movements in Spain and Spanish America. (Nemes)
- SPAN 136. MODERN SPANISH DRAMA. (3)
Significant plays of the nineteenth and twentieth centuries. (Gramberg, Marra-Lopez)
- SPAN 141-142. THE GENERATION OF 1898 AND ITS SUCCESSORS. (3, 3)
Authors and works of all genres of the generation of 1898 and those of the immediately succeeding generation. (Gramberg, Marra-Lopez)
- SPAN 143. THE CONTEMPORARY SPANISH NOVEL. (3)
The novel and the short story from 1940 to the present. (Gramberg)
- SPAN 144. CONTEMPORARY SPANISH POETRY. (3)
Spanish poetry from the generation of 1927 to the present. (Gramberg, Marra-Lopez)
- SPAN 159-160. SPANISH-AMERICAN FICTION. (3, 3)
Representative novels and/or short stories from the Wars of Independence to the present. (Nemes, Staff)
- SPAN 162. SPANISH-AMERICAN POETRY. (3)
Main trends, authors, and works from the Conquest to Ruben Dario. (Panico)

SPAN 163. SPANISH-AMERICAN ESSAY. (3)

A study of the socio-political contents and esthetic qualities of representative works from the Colonial to the Contemporary period. (Nemes)

SPAN 171-172. SPANISH CIVILIZATION. (3, 3)

A survey of two thousand years of Spanish history, outlining the cultural heritage of the Spanish people, their great men, traditions, customs, art and literature, with special emphasis on the interrelationship of social and literary history. (Staff)

SPAN 173-174. LATIN AMERICAN CIVILIZATION. (3, 3)

The cultural heritage of the Latin American people. Pre-Columbian civilizations. Hispanic and other European influences. (Nemes, Panico)

SPAN 195H-196H-197H. HONORS READING COURSE. (3, 3, 3)

Supervised reading to be taken normally only by students admitted to the Honors Program: 195 is poetry; 196 is the novel; 197 is the drama. (Staff)

SPAN 199H. HONORS SEMINAR. (3)

Required of all students in the Honors Program. Other students will be admitted on special recommendation. Conducted in Spanish. Discussion of a central theme with related investigations by students. (Staff)

For Graduates

In order to be accepted in the Graduate School for specialization in Spanish, a student must already have a substantial knowledge of Spanish literature. Accordingly, the special studies courses and the open seminar are not surveys covering the periods indicated. They are intensive investigations within these periods, in which the class acts as a research team concentrating on a different specific theme each semester. The requirements of students will determine which courses will be offered.

SPAN 201. THE HISTORY OF THE SPANISH LANGUAGE. (3)

(Mendeloff)

SPAN 203. COMPARATIVE ROMANCE LINGUISTICS. (3)

(Mendeloff)

SPAN 207-208. MEDIEVAL SPANISH LITERATURE. (3)

Literature of the eleventh through the fifteenth centuries. (Mendeloff)

SPAN 211-212. POETRY OF THE GOLDEN AGE. (3, 3)

(Goodwyn)

SPAN 215-216. SEMINAR: THE GOLDEN AGE IN SPANISH LITERATURE. (3, 3)

(Goodwyn, Rovner)

SPAN 225-226. THE EIGHTEENTH CENTURY. (3, 3)

(Staff)

SPAN 233-234. THE NINETEENTH CENTURY. (3, 3)

(Gramberg)

SPAN 237-238. HISPANIC POETRY OF THE NINETEENTH AND TWENTIETH CENTURIES. (3, 3)

(Gramberg, Marra-Lopez)

SPAN. 241-242. THE TWENTIETH CENTURY. (3, 3)

(Gramberg, Marra-Lopez)

- SPAN. 245. THE DRAMA OF THE TWENTIETH CENTURY. (3)
(Gramberg, Marra-Lopez)
- SPAN. 263-264. COLONIAL SPANISH-AMERICAN LITERATURE. (3, 3)
(Nemes)
- SPAN. 265-266. NATIONAL SPANISH-AMERICAN LITERATURE. (3, 3)
(Nemes)
- SPAN 281-282. READING COURSE FOR MINORS IN SPANISH. (3, 3)
(Staff)
- SPAN 283-284. READING COURSE FOR MINORS IN SPANISH-AMERICAN
LITERATURE. (3, 3)
(Nemes, Staff)
- SPAN 291-292. OPEN SEMINAR. (3, 3)
Topic to be determined. (Staff)
- SPAN 399. RESEARCH. (1-6)
Credits determined by work accomplished. Guidance in the preparation of
master's and doctoral theses. Conferences. (Staff)

PORTUGUESE

- PORT 001-002. ELEMENTARY PORTUGUESE. (3, 3)
First and second semesters. Three recitations and one laboratory per week.
Study of linguistic structure and development of audio-lingual and writing
ability. (Thorpe)
- PORT 006-007. INTERMEDIATE PORTUGUESE. (3, 3)
First and second semesters. Three recitations per week; additional electronic
laboratory in PORT 006. Prerequisite: PORT 002 or equivalent. Study of
linguistic structure, further development of audio-lingual and writing ability,
and reading of literary texts with discussion in Portuguese. (Thorpe)

GERMANIC AND SLAVIC LANGUAGES AND LITERATURES

Professor and Chairman: HERING.

Professors: DOBERT, JONES, PRAHL.

Assistant Professors: HITCHCOCK AND MORRIS.

Instructors: APITZ, CEZEAUX, DULBE, HAHN, HOFFMEISTER, IRWIN, JONES,
JURAN, KLAPOUCHY, KNOCHE, SCHMEISSNER, STANICH, AND TUNIKS.

GERMAN

- GERM 000. ELEMENTARY GERMAN FOR GRADUATE STUDENTS. (AUDIT)
Intensive elementary course in the German language designed particularly for
graduate students who wish to acquire a reading knowledge. (Schmeissner)
- GERM 001-002. ELEMENTARY GERMAN. (3, 3)
Each semester; given as intensive course in summer session. Three recitations
and one audio-lingual drill per week. Study of linguistic structure. Extensive
drill in pronunciation and conversation. (Knoche, Hoffmeister)

GERM 003H. ELEMENTARY GERMAN, HONORS COURSE. (3)

Three recitations and one audio-lingual drill per week. Enrollment limited to specially approved candidates from GERM 001. Students taking this course will normally continue in GERM 007. (Knoche)

GERM 005. REVIEW OF ELEMENTARY GERMAN. (3)

Three recitations and one audio-lingual drill per week. Limited to students who, having taken placement examination, have failed to qualify for GERM 006. (Stanich)

GERM 006-007. INTERMEDIATE LITERARY GERMAN. (3, 3)

Three recitations per week; additional electronic laboratory in GERM 006. Given as intensive course in summer session. Prerequisite: GERM 002 or equivalent, or GERM 005, except that recommended students may enter GERM 007 from GERM 003. Usually there will be an honors section for qualified students. (Schmeissner)

GERM 008. SCIENTIFIC GERMAN. (3)

Prerequisite: GERM 006. Reading of technical and scientific prose.

(Stanich)

GERM 011. INTRODUCTION TO GERMAN LITERATURE. (3)

Prerequisite, GERM 007. Required of all students who continue in advanced courses, with the exception of superior students who are permitted to by-pass an introduction to German literature. May be taken concurrently with GERM 012. (Irwin)

GERM 012. CONVERSATION AND COMPOSITION. (3)

Prerequisite, GERM 007. A practical language course recommended for all students continuing in German. May be taken concurrently with GERM 011. (Irwin)

For Advanced Undergraduates
GERM 071-072. REVIEW GRAMMAR AND COMPOSITION. (3, 3)

Prerequisite, GERM 007, or equivalent. A thorough study of the more detailed points of German grammar with ample practice in composition.

(Schmeissner)

GERM 075-076. SURVEY OF GERMAN LITERATURE. (3, 3)

Prerequisite, GERM 007, or equivalent. A survey of the chief authors and movements in German literature. (Morris)

GERM 080-081. ADVANCED CONVERSATION. (3, 3)

Prerequisite, GERM 007, or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. (Apitz)

For Advanced Undergraduates and Graduates
GERM 101. APPLIED LINGUISTICS. (3)

The nature of Applied Linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and German. Analysis, evaluation and construction of related drills. (Staff)

GERM 103-104. ADVANCED COMPOSITION. (3, 3)

Translation from English into German, free composition, letter writing.

(Cezeaux)

- GERM 125-126. GERMAN LITERATURE OF THE EIGHTEENTH CENTURY.** (3, 3)
The main works of Klopstock, Wieland, Lessing, Herder, Goethe, Schiller.
(Prahl, Hering)
- GERM 131-132. GERMAN LITERATURE OF THE NINETEENTH CENTURY.** (3, 3)
Study of the literary movements from romanticism to naturalism.
(Prahl, Staff)
- GERM 141-142. GERMAN LITERATURE OF THE TWENTIETH CENTURY.** (3, 3)
Prose and dramatic writings from Gerhart Hauptmann to the present. Modern literary and philosophical movements will be discussed.
(Dobert, Staff)
- GERM 171-172. GERMAN CIVILIZATION.** (3, 3)
Study of the literary, educational, artistic traditions; great men, customs, and general culture.
(Morris)
- GERM 191. BIBLIOGRAPHY AND METHODS.** (3)
Second semester. Especially designed for German majors.
(Hansel)
- GERM 195H-196H-197H. HONORS READING COURSE.** (3, 3, 3)
Supervised reading to be taken normally only by students admitted to Honors Program: 195 is poetry; 196 is the novel; 197 is the drama.
(Staff)
- GERM 199H. HONORS SEMINAR.** (3)
Required of all students in the Honors Program. Other students will be admitted on special recommendation. Conducted in German. Discussion of a central theme with related investigations by students.
(Staff)

For Graduates

The requirements of students will determine which courses will be offered.

- GERM 201. HISTORY OF THE GERMAN LANGUAGE.** (3)
(Jones)
- GERM 203. GOTHIC.** (3)
(Jones)
- GERM 204. OLD HIGH GERMAN.** (3)
(Jones)
- GERM 205. MIDDLE HIGH GERMAN.** (3)
(Jones)
- GERM 207. LITERATURE OF OLD HIGH GERMAN AND MIDDLE HIGH GERMAN.** (3)
(Jones)
- GERM 209. PRO-SEMINAR IN GERMAN STUDIES.** (3)
An introduction into the literary methods, esthetic principles and trends of thought in Germanistic studies. Detailed discussion of W. Kayser and *Das Sprachliche Kunstwerk*. Recommended for first year graduate students. Spring semester only.
(Hering)
- GERM 211-212. LITERATURE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.** (3, 3)
(Hering)
- GERM 224-225. GOETHE AND HIS TIME.** (3, 3)
(Hering)
- GERM 226. SCHILLER.** (3)
(Prahl)
- GERM 230. GERMAN ROMANTICISM.** (3)
(Prahl)

- GERM 234. THE GERMAN DRAMA OF THE NINETEENTH CENTURY. (3)
(Dobert)
- GERM 250. THE GERMAN LYRIC. (3)
(Hering)
- GERM 255-256. THE GERMAN NOVEL. (3, 3)
(Hering)
- GERM 258. SEMINAR IN THE GERMAN NOVELLE. (3)
(Dobert)
- GERM 281-282. READING COURSE. (3, 3)
(Dobert)
- GERM 291-292. SEMINAR. (3, 3)
Topic to be determined each semester. (Staff)
- GERM 399. RESEARCH. (1-6)
Credits determined by work accomplished. Guidance in preparation of master's
and doctoral theses. Conferences. (Staff)

RUSSIAN

- RUSS 001-002. ELEMENTARY RUSSIAN. (3, 3)
Three recitations and one laboratory hour per week. Elements of grammar,
pronunciation and conversation; exercises in translation. (Hitchcock, Staff)
- RUSS 006-007. INTERMEDIATE RUSSIAN. (3, 3)
Three recitations per week; additional electronic laboratory in RUSS 006. Pre-
requisite, RUSS 002 or equivalent. Reading of texts designed to give some
knowledge of Russian life, thought and culture. (Hitchcock, Staff)
- RUSS 010. SCIENTIFIC RUSSIAN. (3)
Prerequisite, RUSS 007 or equivalent. Reading of technical and scientific
prose. (Hitchcock)
- RUSS 012-013. CONVERSATION AND COMPOSITION. (3, 3)
Prerequisite, RUSS 007 or equivalent. A practical language course recom-
mended for all students continuing in Russian. (Hitchcock)
- RUSS 071-072. REVIEW GRAMMAR AND COMPOSITION. (3, 3)
Prerequisite, RUSS 007 or equivalent. Designed to give a thorough training
in the structure of the language; drill in Russian composition.
(Hitchcock, Staff)
- RUSS 075-076. SURVEY OF RUSSIAN LITERATURE. (3, 3)
Prerequisite, RUSS 007 or equivalent. An elementary survey of Russian litera-
ture. (Hitchcock)
- RUSS 080-081. ADVANCED CONVERSATION. (3, 3)
Prerequisite, RUSS 012, 013, or consent of instructor. For students who wish
to develop fluency and confidence in speaking the language. (Hitchcock, Staff)

For Advanced Undergraduates and Graduates

- RUSS 101. APPLIED LINGUISTICS. (3)
The nature of Applied Linguistics and its contributions to the effective teaching
of foreign languages. Comparative study of English and Russian, with em-
phasis upon points of divergence. Analysis, evaluation and construction of
related drills. (Hitchcock)

- RUSS 103-104. ADVANCED COMPOSITION. (3, 3)
(Hitchcock)
- RUSS 125. RUSSIAN LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)
(Hitchcock)
- RUSS 135. MODERN RUSSIAN POETRY. (3)
(Hitchcock)
- RUSS 136. MODERN RUSSIAN DRAMA. (3)
(Hitchcock)
- RUSS 137. MODERN RUSSIAN FICTION. (3)
(Hitchcock)
- RUSS 141-142. SOVIET RUSSIAN LITERATURE. (3, 3)
(Hitchcock)

GENERAL BIOLOGICAL SCIENCES

The program has been prepared for the student who is interested in biology but whose interest has not yet centered in any one of the biological sciences. It is suitable for the pre-dental or pre-medical student who plans to earn the B.S. degree before entering professional school. The program includes work in botany, entomology, microbiology, and zoology, and introduces the student to the general principles and methods of each of these biological sciences. The student may then emphasize one of these areas in completing his program.

By proper selection of courses during the junior and senior years, a student may concentrate his work sufficiently in one area of biology to be able to continue graduate work in that field. However, a student who is planning to do graduate work should major in one specific field of biology.

The student following this program must meet the general requirements for a degree in the College of Arts and Sciences. He should select French or German to meet the foreign language requirements and SPCH 007 (or SPCH 001) to fulfill the requirement in speech.

Required introductory courses in the biological sciences: BOTN 001; ENTM 015; MICB 001; ZOOL 001. These courses must be passed with an average grade of at least "C." The pre-professional student must take ZOOL 002 as well.

Required supporting courses in mathematics and physical sciences: MATH 010, 011; CHEM 001, 003; PHYS 010, 011. The student working in most areas of biology will also need a year of organic chemistry (CHEM 031, 033, or CHEM 035, 036, 037, 038). Additional work in chemistry may also be required by the student's adviser, in accordance with the needs of the student's field of emphasis. The pre-professional student must include CHEM 035, 036, 037, 038 in his program.

Advanced courses in the biological sciences: The student must complete at least 30 semester hours of advanced work selected from the fields of botany, entomology, microbiology, and zoology. Of these credits at least 18 must be at the 100 level and taken in at least two of the four departments. The following courses in psychology may be counted as part of the required 30 semester hours but may not be used to satisfy the requirement of 18 semester hours at the 100 level: PSYC 106, 136, 145, 180, 181, 195.

A junior or senior following this curriculum will be advised by the department in which he plans to do the most work.

GENERAL PHYSICAL SCIENCES

This program has been prepared for the student who desires an introduction to the physical sciences but whose interest has not yet centered in any one field of the physical sciences. The program includes work in chemistry, mathematics, and physics, and permits the student to emphasize one of these fields without having to meet the full requirements for a major in one specific field. The program is not recommended for students who may later do graduate work in mathematics or in one of the physical sciences.

The student following this program must meet the general requirements for a degree in the College of Arts and Sciences. He should select French, Russian or German to meet the foreign language requirement and SPCH 007 (or SPCH 001) to fulfill the requirement in speech.

Required introductory courses in mathematics and the physical sciences: MATH 019; CHEM 001, 003; PHYS 010, 011 (or 020, 021 or 015, 016). These courses must be passed with an average grade of at least "C" for the student to be eligible to continue with the program.

Advanced courses in mathematics and the physical sciences: The student must complete at least 36 semester hours of advanced work selected from the Departments of Chemistry, Mathematics, and Physics and Astronomy. Of these credits at least 18 must be at the 100 level and taken in at least two of the three departments with no less than three credits in the second department. The student should normally take Calculus (MATH 020, 021) inasmuch as practically all the advanced work in mathematics and physics requires calculus.

GEOGRAPHY

Geography is a recognized major field in Arts and Sciences leading to the B.A. degree, although the Department is administered by the College of Business and Public Administration. Freshmen and sophomores wishing to major in geography should consult their lower division advisers and the Department of Geography. The following courses are required for a major: GEOG 010 and 011—General Geography (3, 3); GEOG 030—Principles of Morphology (3); GEOG 042—Fundamentals of Meteorology and Climatology (3); GEOG 170—Local Field Course (3); GEOG 199—Undergraduate Thesis Research (3); a regional course; and 12 hours in other geography courses numbered 100 to 198. Descriptions of courses in geography will be found in the catalog of the College of Business and Public Administration.

The following supporting courses are required: AGRO 114 (4); BOTN 113 (2); ECON 031 and 032 (3, 3); SOCY 121 and 122 (3, 3). Certain of these courses are applicable to the minor. Please consult Senior Adviser, Department of Geography.

GOVERNMENT AND POLITICS

Although this Department is administered by the College of Business and Public Administration, government and politics is a recognized major field for students in the College of Arts and Sciences, leading to the B.A. degree. Freshmen wishing to major in government and politics should consult their Lower Division advisers about preparation for the major; additional informa-

tion about the government and politics program may be obtained at the Departmental office.

Arts and Sciences students may pursue the general GVPT curriculum or the more specialized International Affairs curriculum. (Only BPA students may pursue a specialized curriculum in Public Administration.)

Government and Politics majors must take a minimum of 36 semester hours in Government and Politics and may not count more than 42 hours in GVPT toward graduation. No course with a grade less than "C" may be used to satisfy major requirements.

The Government and Politics fields are as follows: (1) American Government and Politics; (2) Comparative Government; (3) International Affairs; (4) Political Theory; (5) Public Administration; (6) Public Law; and (7) Public Policy and Political Behavior.

All GVPT majors are required to take GVPT 001—American Government (3); GVPT 003—Principles of Government and Politics (3); GVPT 020—Introduction to Political Behavior (3); and GVPT 141—History of Political Theory (3) or GVPT 142—Recent Political Theory (3). They must also take one GVPT course from three separate fields exclusive of Political Theory. In addition (a) GVPT majors (general) must take at least 15 GVPT semester hours at the 100 level; (b) GVPT majors taking the International Affairs curriculum must complete at least 15 semester hours at the 100 level in international affairs and comparative government courses, including GVPT 101—International Political Relations (3).

All students majoring in GVPT (general) must take a minimum of 12 semester hours in one foreign language. Students majoring in GVPT with specialization in International Affairs must take a minimum of 12 semester hours in one foreign language *above the first year elementary course*. (The first year elementary requirement may be waived by high school credit or placement tests.)

All students majoring in GVPT must fulfill the requirements of a minor. The general requirement is the completion of 18 semester hours from approved Arts and Sciences departments other than GVPT. At least six of the 18 hours must be taken at the 100 level from a single department. Students majoring in GVPT with specialization in International Affairs may choose to take all minor courses in geographical area studies or may take them all on a departmental basis.

Students who major in Government and Politics may apply for admission to the GVPT Honors Program during the second semester of their sophomore year. Additional information concerning the Honors Program may be obtained at the departmental office.

Descriptions of courses in government and politics will be found in the catalog of the College of Business and Public Administration.

HISTORY

Professor and Chairman: HABER.

Professors: BAUER, COLE, GORDON, HARLAN, JASHEMSKI, KOCH, LAND, MERRILL, PRANGE, SPARKS.

Visiting Professor: CRAVEN.

Associate Professors: CALLCOTT, FOLSOM, MAYO, RIVLIN, YANEY.

Visiting Associate Professor: BRENT.

Assistant Professors: BELZ, BEVERIDGE, BRANN, BRADBURY, BRESLOW, CARTER, FARRELL, GIFFIN, GILBERT, GREENBERG, HARRIS, MATOSSIAN, NICKLASON, OLSON, ROBERTSON, STOWASSER, WILLIAMS, WRIGHT.

Visiting Assistant Professors: HERNON AND KINNAIRD.

Lecturers: BARILLARI, BLASSINGAME, BROWNE, COCKBURN, FLACK, VASQUEZ.

Instructor: VAN NESS.

The Department of History seeks to provide students with the broadest possible cultural background. In a more specific way, the curriculum provides preparation for men and women interested in secondary school teaching, journalism, research and archival work, government and foreign service. In addition, the curriculum offers preparation for those who intend to pursue graduate study.

A faculty adviser will assist each major in planning a curriculum to meet his personal interests. Students should meet regularly with their advisers to discuss the progress of their studies.

Requirements for History Majors:

1. As prerequisites, majors must complete HIST 021, 022, 041, and 042. Students who are exempt from HIST 021 and 022 may take any one U. S. history course in their place.
2. In addition to the prerequisites, majors must complete a minimum of 27 hours of history with grades of C or better. These 27 hours must include (a) at least nine hours of American history, which may include Latin American and Canadian history, (b) at least nine hours of European or Asian history (c) three hours of HIST 199.
3. Majors must complete a minor which is approved by a departmental adviser. Generally this will comprise 18 hours of work in a related department such as government and politics, economics, sociology, literature, philosophy, and fine arts. Sometimes a minor may be split, with at least nine hours of work in each of two related departments. The minor must include at least six hours of 100-level work in a single department. Grades in the minor must average C or better.

HONORS IN HISTORY

Students who major or minor in history may apply for admission to the History Honors Program during the second semester of their sophomore year. Those who are admitted to the program substitute discussion courses and a thesis for some of their required lecture courses, and they take an oral and written comprehensive examination prior to graduation. Successful candidates are awarded either honors or high honors in history.

The History Department offers *pre-honors* work in American history (HIST 057, 058) and *pre-honors* sections in Western Civilization (HIST 041, 042). Students in these sections meet in a discussion group instead of attending lectures. They read widely and do extensive written work on their own. Pre-honors sections are open to any student and recommended for students in General Honors, subject only to the instructor's approval. Students who intend to apply for admission to the History Honors Program should take as many of them as possible during their freshman and sophomore years.

GENERAL EDUCATION REQUIREMENTS IN HISTORY

The courses with numbers up to 100 (except HIST 057 and 058 are particularly recommended to students seeking to meet the General Education requirements. These courses are especially designed for the student who wishes to enrich his knowledge and understanding of a particular society or culture in a comparatively broad chronological framework, even though he might have no professional interest in history. They may be taken during the sophomore, junior or senior years.

Students with an exceptionally good background in history may substitute 100-level courses where there are no stated prerequisites.

HIST 021. HISTORY OF THE UNITED STATES TO 1865. (3)

A survey of the history of the United States from colonial times to the end of the Civil War. Emphasis on the establishment and development of American institutions.
(American History Staff)

HIST 022. HISTORY OF THE UNITED STATES SINCE 1865. (3)

A survey of economic, social, intellectual, and political developments since the Civil War. Emphasis on the rise of industry and the emergence of the United States as a world power.
(American History Staff)

HIST 023. SOCIAL AND CULTURAL HISTORY OF EARLY AMERICA. (3)

A study of the social and cultural history of the United States as a predominantly agricultural society. Examination of how the social milieu shapes the cultural development of the nation and its institutions.
(American History Staff)

HIST 024. SOCIAL AND CULTURAL HISTORY OF MODERN AMERICA. (3)

A study of the social and cultural history of the United States as a society in transition. Examination of the social and cultural changes that accompanied industrial and scientific development.
(American History Staff)

HIST 029. THE UNITED STATES IN WORLD AFFAIRS. (3)

A study of the United States as an emerging world power and the American response to changing status in world affairs. Emphasis on the relationship between internal and external development of the nation.
(American History Staff)

HIST 031, 032. LATIN AMERICAN HISTORY. (3, 3)

A survey of the history of Latin America from colonial origins to the present, covering political, cultural, economic, and social development, with special emphasis upon relations with the United States. First semester: Colonial Latin America. Second semester: the Republics.
(Latin American History Staff)

HIST 041, 042. WESTERN CIVILIZATION. (3, 3)

This course is designed to give the student an appreciation of the civilization in which he lives in its broadest setting. The study begins with the collapse of classical civilization and comes to the present.
(European History Staff)

HIST 051, 052. THE HUMANITIES. (3, 3)

In surveying history from prehistoric times to the present, man's cultural development is emphasized. The course is a study of the achievements of the various civilizations which have contributed to the common cultural heritage of western civilization. It is designed as an introductory course in history which will make a more direct contribution to the other liberal art fields. First semester, to the Renaissance. Second semester, since the Renaissance.

(Jashemski)

HIST 053, 054. HISTORY OF ENGLAND AND GREAT BRITAIN. (3, 3)

A history of the development of British life and institutions. Open to all classes. Especially recommended for English majors and minors and pre-law students. First semester, to 1485. Second semester, since 1485.

(English History Staff)

HIST 057. PRE-HONORS COLLOQUIUM IN EARLY AMERICAN HISTORY. (3)

Selected readings in modern American history with emphasis on independent discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.

(American History Staff)

HIST 058. PRE-HONORS COLLOQUIUM IN MODERN AMERICAN HISTORY. (3)

Selected readings in modern American history with emphasis on independent study, discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.

(American History Staff)

HIST 061, 062. FAR EASTERN CIVILIZATION. (3, 3)

This course seeks to give the student an understanding of a great civilization radically different from our own, and an appreciation of the complex problems of the Far East and of American policy there. The approach is interdisciplinary within a historical framework.

(Folsom, Mayo)

HIST 071, 072. ISLAMIC CIVILIZATION. (3, 3)

This course seeks to give the student an insight into a cultural heritage that dominates the lives of over four hundred million people today. The study covers Islam in Spain, North Africa, Africa below the Sahara, India, and Indonesia as well as the Middle East. The approach is humanistic within a historical framework.

(Rivlin, Stowasser)

For Advanced Undergraduates and Graduates

AMERICAN HISTORY**HIST 101. AMERICAN COLONIAL HISTORY. (3)**

The settlement and development of colonial America to the middle of the eighteenth century.

(Land)

HIST 102. THE AMERICAN REVOLUTION. (3)

The background and course of the American Revolution through the formation of the Constitution.

(Bradbury)

HIST 103. THE FORMATIVE PERIOD IN AMERICA, 1789-1824. (3)

The evolution of the Federal government, the origins of political parties, problems of foreign relations in an era of international conflict, beginnings of the industrial revolution in America, and the birth of sectionalism.

(Bradbury)

HIST 107, 108. ECONOMIC HISTORY OF THE UNITED STATES. (3, 3)

The development of the American economy and its institutions. First semester, to 1865; second semester, since 1865.

(Staff)

HIST 109, 110. SOCIAL HISTORY OF THE UNITED STATES. (3, 3)

Formation of regional societies; immigration and nativism; the Negro; urban movement; social responses to technological change. First semester to 1865; second semester, since 1865.

(Beveridge)

HIST 114. THE MIDDLE PERIOD OF AMERICAN HISTORY, 1824-1860. (3)

An examination of the political history of the United States from Jackson to

Lincoln with particular emphasis on the factors producing Jacksonian democracy, Manifest Destiny, the Whig Party, the anti-slavery movement, the Republican Party, and secession. (Sparks)

HIST 115. HISTORY OF THE SOUTH. (3)

Prerequisite, HIST 021, 022 or equivalent. The ante-bellum plantation society, the institution of slavery, the experience of defeat, and the impact of the modern world. (Callcott)

HIST 116. THE CIVIL WAR. (3)

Military aspects; problems of the Confederacy; political, social, and economic effects of the war upon American society. (Sparks)

HIST 118, 119. RECENT AMERICAN HISTORY. (3, 3)

Party policies, domestic issues, foreign relations of the United States since 1890. First semester, to 1929. Second semester, since 1929.

(Merrill, Harlan, Olson)

HIST 121. HISTORY OF THE AMERICAN FRONTIER. (3)

The Trans-Allegheny West. The westward movement into the Mississippi Valley. (Staff)

HIST 124. RECONSTRUCTION AND THE NEW NATION, 1865-1896. (3)

Prerequisite, six credits of American history, or permission of instructor. Problems of construction in both South and North. Emergence of big business and industrial combinations. Problems of the farmer and laborer. (Staff)

HIST 127, 128. DIPLOMATIC HISTORY OF THE UNITED STATES. (3, 3)

A historical study of the diplomatic negotiations and foreign relations of the United States. First semester, from the Revolution to 1898. Second semester, from 1898 to the present. Students who have taken HIST 029 are admitted only by permission of instructor. (Cole)

HIST 133, 134. THE HISTORY OF IDEAS IN AMERICA. (3, 3)

A history of basic beliefs about religion, man, nature, and society. Consent of the instructor is required for HIST 134. (Koch)

HIST 135, 136. CONSTITUTIONAL HISTORY OF THE UNITED STATES. (3, 3)

A study of the historical forces resulting in the formation of the Constitution, and development of American constitutionalism in theory and practice thereafter. (Belz)

HIST 141. HISTORY OF MARYLAND. (3)

Political, social, and economic history of Maryland from seventeenth century to the present. (Staff)

HIST 146. DIPLOMATIC HISTORY OF LATIN AMERICA. (3)

A survey of the political, economic, and cultural relations of the Latin American nations with emphasis on their relations with the United States and the development of the inter-American system. (Wright)

HIST 147. HISTORY OF MEXICO AND THE CARIBBEAN. (3)

The history of Mexico and the Caribbean with special emphasis upon the independence period and upon relations between ourselves and our nearest Latin American neighbors. (Wright)

HIST 148. HISTORY OF CANADA. (3)

Prerequisites, HIST 041, 042, or HIST 053, 054. A history of Canada, with special emphasis on the nineteenth century and upon Canadian relations with Great Britain and the United States. (Gordon)

- HIST 149. HISTORY OF BRAZIL. (3)**
The history of Brazil with emphasis on the national period. (Giffin)
- HIST 150. HISTORY OF ARGENTINA AND THE ANDEAN REPUBLICS. (3)**
The history of the nationalist period of selected South American countries. (Staff)

EUROPEAN HISTORY

- HIST 151. HISTORY OF THE ANCIENT ORIENT AND GREECE. (3)**
A survey of the ancient civilizations of Egypt, the Near East, and Greece, with particular attention to their institutions, life, and culture. (Jashemski)
- HIST 153. HISTORY OF ROME. (3)**
A study of Roman civilization from the earliest beginnings through the Republic and down to the last centuries of the Empire. (Jashemski)
- HIST 155, 156. HISTORY OF MEDIEVAL EUROPE. (3, 3)**
A study of medieval government, society, and thought from the collapse of classical civilization to the Renaissance. (Robertson)
- HIST 157. THE AGE OF ABSOLUTISM, 1648-1748. (3)**
Europe in the Age of Louis XIV and the Enlightened Despots. (Williams)
- HIST 158. THE OLD REGIME AND THE FRENCH REVOLUTION, 1748-1815. (3)**
Europe in the era of the French Revolution. (Williams)
- HIST 159, 160. HISTORY OF EUROPEAN IDEAS. (3, 3)**
Prerequisites, HIST 041, 042 or HIST 053, 054, or the equivalent. Beginning with a review of the basic Western intellectual traditions as a heritage from the Ancient World, the courses will present selected important currents of thought from the scientific revolution of the sixteenth and seventeenth centuries down to the twentieth century. First semester, through the eighteenth century. Second semester, nineteenth and twentieth centuries. (Haber)
- HIST 161, 162. THE RENAISSANCE AND REFORMATION. (3, 3)**
Prerequisite, HIST 041, 042, or 053, or consent of instructor. City-states and the rise of nation-states, the culture and thought of the Renaissance, the Reformations and their impact into the seventeenth century. (Brann)
- HIST 163, 164. HISTORY OF THE BRITISH EMPIRE. (3, 3)**
Prerequisite, HIST 041, 042, or HIST 053, 054. First semester, the development of England's Mercantilist Empire and its fall in the war for American Independence (1783). Second semester, the rise of the Second British Empire and the solution of the problem of responsible self-government (1783-1867), the evolution of the British Empire into a Commonwealth of Nations, and the development and problems of the dependent Empire. (Gordon)
- HIST 165, 166. CONSTITUTIONAL HISTORY OF GREAT BRITAIN. (3, 3)**
Constitutional development in England, with emphasis on the history of the royal prerogative, the growth of the common law, the development of Parliament, and the emergence of systematized government. First semester, to 1485; second semester, since 1485. (Cockburn)
- HIST 167, 168. HISTORY OF RUSSIA. (3, 3)**
A history of Russia from earliest times to 1917. (Yaney)
- HIST 169, 170. EUROPE IN THE NINETEENTH CENTURY, 1815-1919. (3, 3)**
Prerequisite 041, 042, or HIST 053, 054. A study of the political, economic, social and cultural development of Europe from the Congress of Vienna to the First World War. (Bauer)

HIST 171, 172. EUROPE IN THE WORLD SETTING OF THE TWENTIETH CENTURY. (3, 3)

Prerequisites, HIST 041, 042, or HIST 053, 054. A study of political, economic, and cultural developments in twentieth-century Europe with special emphasis on the factors involved in the two World Wars and their global impacts and significance. (Prange)

HIST 173. THE SOVIET UNION. (3)

A history of the Bolshevik Revolution and the founding of the Soviet Union; the economic policy and foreign policy of the U.S.S.R. to the present.

(Yaney)

HIST 175. MODERN FRANCE. (3)

A survey of French history from 1815 to the present. The emphasis is upon such topics as the population problem, the economic and social structure of French society, and the changing political and cultural values of this society in response to recurrent crises through the nineteenth and twentieth centuries.

(Greenberg)

HIST 176. TUDOR ENGLAND. (3)

An examination of the political, religious, and social forces in English life, 1485-1603, with special emphasis on Tudor government, the English Reformation, and the Elizabethan era.

(Breslow)

HIST 177. STUART ENGLAND. (3)

An examination of the political, religious, and social forces in English life, 1603-1714, with special emphasis on Puritanism and the English revolutions.

(Breslow)

ASIAN HISTORY

HIST 187, 188. HISTORY OF CHINA. (3, 3)

A history of China from earliest times to the present. The emphasis is on the development of Chinese institutions that have molded the life of the nation and its people.

(Folsom)

HIST 189, 190. HISTORY OF JAPAN. (3, 3)

First semester: Japanese civilization from the age of Shinto mythology, introduction of continental learning, and rule of military overlords. Second semester: renewed contact with the western world and Japan's emergence as a modern state.

(Mayo)

HIST 191. HISTORY OF THE ARABS. (3)

HIST 071 and 072 recommended but not required. Arab history from the pre-Islamic period to modern times.

(Rivlin)

HIST 192. HISTORY OF THE TURKS. (3)

HIST 071 and 072 recommended but not required. Survey of Turkish history from earliest times to the present, with special emphasis on the Seljuqs, the Ottoman Empire, and the Republic of Turkey.

(Rivlin)

HIST 193. HISTORY OF IRAN. (3)

HIST 071 and 072 recommended but not required. Survey of Iranian history from earliest times to the present with emphasis on period since the rise of the Safavids in the sixteenth century.

(Rivlin)

HIST 194. HISTORY OF THE JEWS AND THE STATE OF ISRAEL. (3)

A survey of Jewish history from the second century Diaspora to the present with special attention to an analysis of Zionism, the creation of a Jewish home in Palestine, the establishment of the State of Israel, and modern developments.

(Rivlin)

HIST 195, 196. HONORS COLLOQUIUM. (3, 3)

Enrollment limited to students admitted by the departmental Honors Committee. Reading in sources and secondary work centering about the development of the modern world. Discussions of reading and written work in weekly seminar meetings. (Staff)

HIST 198. HONORS THESIS. (3)

Limited to students who have completed HIST 195. Normally repeated for a total of six hours credit during the senior year by candidates for honors in history. (Staff)

HIST 199. PRO-SEMINAR IN HISTORICAL WRITING. (3)

Discussions and research papers designed to acquaint the student with the methods and problems of research and presentation. The student will be encouraged to examine those phases of history which he regards as his specialties. (Staff)

*For Graduates***HIST 200. HISTORIOGRAPHY: TECHNIQUES OF HISTORICAL RESEARCH AND WRITING. (3)**

(Staff)

HIST 201. READINGS IN COLONIAL AMERICAN HISTORY. (3)

(Land)

HIST 202. SEMINAR IN COLONIAL AMERICAN HISTORY. (3)

(Land)

HIST 203. READINGS IN THE AMERICAN REVOLUTION AND THE FORMATIVE PERIOD. (3)

(Staff)

HIST 204. SEMINAR IN THE AMERICAN REVOLUTION AND THE FORMATIVE PERIOD. (3)

(Staff)

HIST 205. READINGS IN AMERICAN SOCIAL AND ECONOMIC HISTORY. (3)

(Staff)

HIST 206. SEMINAR IN AMERICAN SOCIAL AND ECONOMIC HISTORY. (3)

(Staff)

HIST 213. READINGS IN SOUTHERN HISTORY. (3)

(Callcott)

HIST 214. SEMINAR IN SOUTHERN HISTORY. (3)

(Callcott)

HIST 215. READINGS IN THE MIDDLE PERIOD AND CIVIL WAR. (3)

(Sparks)

HIST 216. SEMINAR IN THE MIDDLE PERIOD AND CIVIL WAR. (3)

(Sparks)

HIST 217. READINGS IN RECONSTRUCTION AND THE NEW NATION. (3)

(Staff)

HIST 218. SEMINAR IN RECONSTRUCTION AND THE NEW NATION. (3)

(Staff)

HIST 223. READINGS IN RECENT AMERICAN HISTORY. (3)

(Merrill, Harlan, Olson, Shannon)

HIST 224. SEMINAR IN RECENT AMERICAN HISTORY. (3)

(Merrill, Harlan, Olson, Shannon)

HIST 227. READINGS IN THE HISTORY OF AMERICAN FOREIGN POLICY. (3)

(Cole)

- HIST 228. SEMINAR IN THE HISTORY OF AMERICAN FOREIGN POLICY. (3)
(Cole)
- HIST 233. READINGS IN AMERICAN INTELLECTUAL HISTORY. (3)
(Koch)
- HIST 234. SEMINAR IN AMERICAN INTELLECTUAL HISTORY. (3)
(Koch)
- HIST 236. SEMINAR IN AMERICAN CONSTITUTIONAL AND POLITICAL HISTORY. (3)
(Belz)
- HIST 242. SEMINAR IN THE HISTORY OF MARYLAND. (3)
(Staff)
- HIST 245. READINGS IN LATIN AMERICAN HISTORY. (3)
(Giffin, Wright)
- HIST 246. SEMINAR IN LATIN AMERICAN HISTORY. (3)
(Giffin, Wright)
- HIST 251. SEMINAR IN GREEK HISTORY. (3)
(Jashemski)
- HIST 253. SEMINAR IN ROMAN HISTORY. (3)
(Jashemski)
- HIST 355. READINGS IN MEDIEVAL HISTORY. (3)
(Robertson)
- HIST 256. SEMINAR IN MEDIEVAL HISTORY. (3)
(Robertson)
- HIST 259. READINGS IN MODERN EUROPEAN INTELLECTUAL HISTORY. (3)
(Haber)
- HIST 260. SEMINAR IN MODERN EUROPEAN INTELLECTUAL HISTORY. (3)
(Haber)
- HIST 261. READINGS IN THE HISTORY OF THE RENAISSANCE AND REFORMATION. (3)
(Brann)
- HIST 263. READINGS IN THE HISTORY OF GREAT BRITAIN AND THE BRITISH
EMPIRE-COMMONWEALTH. (3)
(Gordon)
- HIST 264. SEMINAR IN THE HISTORY OF GREAT BRITAIN AND THE BRITISH
EMPIRE-COMMONWEALTH. (3)
(Gordon)
- HIST 266. SEMINAR IN TUDOR AND STUART ENGLAND. (3)
(Breslow)
- HIST 268. SEMINAR IN RUSSIAN HISTORY. (3)
(Yaney)
- HIST 269. READINGS IN NINETEENTH CENTURY EUROPE. (3)
(Bauer)
- HIST 270. SEMINAR IN NINETEENTH CENTURY EUROPE. (3)
(Bauer)
- HIST 271. SEMINAR IN THE HISTORY OF WORLD WAR I. (3)
(Prange)
- HIST 272. SEMINAR IN THE HISTORY OF WORLD WAR II. (3)
(Prange)
- HIST 274. READINGS IN MODERN FRENCH HISTORY. (3)
(Greenberg)
- HIST 275. SEMINAR IN MODERN FRENCH HISTORY. (3)
(Greenberg)
- HIST 281. READINGS IN MIDDLE EASTERN HISTORY. (3)
(Rivlin)

HIST 282. SEMINAR IN MIDDLE EASTERN HISTORY. (3)	(Rivlin)
HIST 285. READINGS IN JAPANESE HISTORY. (3)	(Mayo)
HIST 286. SEMINAR IN JAPANESE HISTORY. (3)	(Mayo)
HIST 287. READINGS IN CHINESE HISTORY. (3)	(Folsom)
HIST 288. SEMINAR IN CHINESE HISTORY. (3)	(Folsom)
HIST 290. THE TEACHING OF HISTORY IN INSTITUTIONS OF HIGHER LEARNING. (1)	(Staff)
HIST 399. THESIS RESEARCH. (1-6)	(Staff)

GENERAL HONORS PROGRAM

Director: Portz

The General Honors Program is administered by the Director of the Arts and Sciences Honors Programs and by the College Honors Committee which also acts as an advisory and regulatory body for all Honors Programs within the College. Admission to the General Honors Program shall ordinarily be at the beginning of the first or second semester of the student's freshman year. Students are selected on the basis of SAT scores, grades, rank in graduating class, recommendations from high school teachers and counsellors, and other factors dealing with academic achievement in high school. Students transferring from other institutions are accepted into General Honors upon presentation of a distinguished academic record.

General Honors students are assigned to Honors sections of basic General Education courses, and are given the opportunity of participating in special General Honors seminars. Continuance in the Program is based upon maintaining a B average or better. Successful General Honors students are graduated with a citation in General Honors and notation of this accomplishment is made upon their transcripts. For further information and admission to General Honors, see the Director of Honors, Francis Scott Key Hall.

Special General Honors Seminars

Open to General and Departmental Honors students and to other students with the consent of the instructor or of the Director of Honors.

HONR 012. SEMINAR IN THE HUMANITIES: ROMANTICISM AND THE ROMANTIC AGE. (3)

An interdisciplinary course studying the literature, ideas, art, and music of the Romantic Age. Not open to freshmen.

HONR 021. INTERDISCIPLINARY SEMINAR IN THE SOCIAL SCIENCES. (3)

A review of contemporary principles and methods in the Social Sciences, together with discussions of special topics from the viewpoints of the various Social Sciences. Not open to freshmen.

HONR 050-051. SEMINAR IN AMERICAN STUDIES: AMERICAN TASTE IN THE TWENTIETH CENTURY. (3, 3)

An interdisciplinary course to investigate the development of public taste in modern America, especially the relationship between popular expression—the motion picture, jazz, best sellers, Broadway theatre—and the more traditional forms of the fine arts and literature. Not open to freshmen.

HONR 100. CONTINENTAL BACKGROUNDS OF THE ENGLISH RENAISSANCE. (3)

Prerequisite, ENGL 001, 003, and 004; or ENGL 021, 033, and 034. An interdisciplinary study of the painting, architecture, philosophy, and literature of the Continental Renaissance and its influence on English literature of the period. Not open to freshmen.

HONR 110. SEMINAR IN SCIENCE AND MODERN SOCIETY. (3)

A seminar dealing with the impact of science upon modern society. Subjects and faculty to vary from semester to semester. Intended for both non-science and science majors. Not open to freshmen.

HONR 120. SEMINAR IN THE FINE ARTS. (3)

To be participated in by various members of the Fine Arts Departments. The subject to vary from semester to semester. Prerequisite: A General Education course in one of the participating departments. A course in a second participating department is recommended but not required. Open to General and Departmental Honors students at the junior and senior level and to other students with the consent of the instructor or the Director of Honors.

HONR 130A. SEMINAR IN THE SOCIAL SCIENCES: POLITICAL THEMES IN CONTEMPORARY LITERATURE. (3)

A course analyzing political concepts and themes in novels and plays with particular emphasis on literature written after 1945. Not open to freshmen.

HONR 130C. SEMINAR IN THE SOCIAL SCIENCES: PSYCHOLINGUISTICS. (3)

An interdisciplinary seminar designed to bring out the interrelations between certain principles of psychology and certain concepts from linguistics, such as linguistic units, the nature of grammatical functioning, and the hypothesis of linguistic relativity. Open to Honors students who have completed PSYC 001, and other students with the consent of the instructors or the Director of Honors.

HONR 140A. AN INTRODUCTION TO SPACE AND TIME. (4)

A laboratory course in Physics intended for the non-science major. No prerequisite. Open to General and Departmental Honors students on the sophomore, junior, and senior level, and to other students with the consent of the instructor or the Director of Honors.

HONR 150A. THEATER AS TOTAL EXPERIENCE. (3)

An interdisciplinary seminar shared by the English and the Speech and Dramatic Arts Departments. No prerequisites. Open to sophomore, junior, and senior General and Departmental Honors students and to other students with the consent of the instructors or the Director of Honors.

LINGUISTICS PROGRAM

Advisory Committee on Linguistics:

Professors: DINGWALL, EDMUNDSON, HORTON, MANNING, SPARKS, AND WILLIAMS.

*Faculty:**Assistant Professors:* DINGWALL (*Director*) AND TUNIKS (*Russians-Linguistics*).*Lecturer:* SHEN (*Chinese-Linguistics*).

The program in linguistics is designed to provide students with a comprehensive and consistent view of the accomplishments, methodology and problems of modern linguistic science which has as its aim the explication of the facts of specific natural languages as well as natural language in general. While any educated man will benefit from an understanding of the structure and development of language, those who expect to become scholars and teachers of anthropology, English, foreign languages, philosophy or speech will find a background in linguistics invaluable. Although there is not an undergraduate major in linguistics at this time, courses in linguistics may be used to fulfill the supporting courses requirement in some programs leading to the B.A. or B.S. degree.

LING 071. LANGUAGE AND CULTURE. (3)

Prerequisite sophomore standing. A non-technical introduction to linguistics, with special consideration of the relations between language and other aspects of culture. (Listed also as ANTH 071.) (Dingwall)

LING 101. INTRODUCTION TO LINGUISTICS. (3)

Introduction to the basic concepts of modern descriptive linguistics. Phonology, morphology, syntax. Examinations of the methods of comparative linguistics, internal reconstruction, dialect geography. (Listed also as ANTH 171 and as ENGL 105.) (Tuniks)

LING 102. PHONETICS AND PHONEMICS. (3)

Training in the identification, description, and symbolization of various sounds found in language. Study of scientific techniques for classifying sounds into units which are perceptually relevant for a given language. (Dingwall)

LING 103. MORPHOLOGY AND SYNTAX. (3)

A detailed study of language structure. No student may receive credit for both LING 103 and ENGL 108. (Dingwall)

LING 106. HISTORICAL LINGUISTICS. (3)

Prerequisite LING 102 and 103, or equivalent. A study of change in the phonological, grammatical and semantic structures of natural languages; language typology; reconstruction and various allied topics will be treated. (Dingwall)

LING 201. SEMINAR IN LINGUISTICS. (3)

Topic to be selected each semester. (Dingwall)

Other programs also offer courses in linguistics that may be of interest to the student:

CMSC 190C. MATHEMATICAL LINGUISTICS. (3)

(Edmundson)

HONR 130C. SEMINAR IN THE SOCIAL SCIENCES: PSYCHOLINGUISTICS. (3)

(Dingwall, Horton)

MATHEMATICS

Professor and Chairman: GOLDHABER.*Professor and Associate Chairman:* HUMMEL.

Professors: AUSLANDER, BRACE, DOUGLIS, GOLDBERG, GOOD, GREENBERG, HORVATH, JACKSON, KARP, KURODA, J. LEHNER, MARTIN, PEARL, REINHART, STELLMACHER, SYSKI, WALSH.

Visiting Professors: HUET, KOETHE.

Associate Professors: CHU, COOK, CORREL, DANIEL, EHRLICH, GULICK, HARRIS, KLEPPNER, G. LEHNER, MALTESE, MARTENS, MIKULSKI, STRAUSS, ZEDEK.

Assistant Professors: BENEDETTO, BERG, COLE, CONNELL, DANCIS, EGAN, ELLIS, GARSTENS, GOWEN, GREEN, HELZER, HENKELMAN, HOLZSAGER, KIRWAN, LAY, LOPEZ-ESCOBAR, MARKLEY, MCGUINNESS, NERI, NIETO, OSBORN, OWINGS, RASTOGI, ROSELLE, SCHNEIDER, SEDGEWICK, SHEPHERD, THALER, TIMSANS, WAGNER, WOLFE.

Visiting Assistant Professor: BRANNAN.

Instructors: BERNHARDT, BROWN, CURRIER, KASTNER, KILBOURN, LEPSON, MAR, MCCLAY, MCKEEN, RAWLINGS, SORENSON, STEELY, VANDERSLICE.

Faculty Research Assistants: GURFEIN, HILL.

Lecturer: LAKEIN.

The Mathematics Department Colloquium meets frequently throughout the academic year for reports on current research by the resident staff, visiting lecturers, and graduate students. In addition, the Institute for Fluid Dynamics and Applied Mathematics Colloquium meets at frequent intervals for reports on research in those fields. All colloquium meetings are open to the public.

The local chapter of Pi Mu Epsilon, national honorary mathematics fraternity, meets regularly for the discussion of mathematical topics of interest to the undergraduates. Its programs are open to the public.

MATHEMATICS MAJOR

The program in mathematics leading to the degree of Bachelor of Science in Mathematics offers training in the fundamentals of mathematics in preparation for graduate work or teaching, and for positions in governmental or industrial laboratories.

A student intending to major in mathematics must complete the introductory sequence: MATH 019, 020, 021, 022 or the corresponding honors sequence: MATH 050, 051, 052, 053. In addition, the normal requirements for a mathematics major include 24 credit hours of upper division (100-level) work and at least 22 credit hours of supporting courses.

Mathematics majors who have completed the introductory sequence MATH 019 thru MATH 022 after September 1, 1966, are required to take at least eight 100-level courses including MATH 103 (Introduction to Abstract Algebra), MATH 110 (Advanced Calculus), MATH 119 (Several Real Variables) and either MATH 100 (Vector and Matrices) or MATH 104 (Introduction to Linear Algebra). In the remaining four required courses, at least two must be selected from the following groups: Group III, Geometry and Topology; Group IV, Statistics and Probability; Group V, Applied Mathematics; Group VI, Foundations.

Mathematics majors who have completed the departmental honors sequence MATH 050-053 since September 1, 1966, will have covered the content of MATH 110 and therefore may not take MATH 110 for credit. For these

students the above requirement of "eight 100-level courses including MATH 103, 110, 119 and either MATH 100 or 104" is changed to "seven 100-level courses including MATH 103, 119 and either MATH 100 or 104."

Candidates for departmental honors are permitted to include MATH 190, 191 and 200-level courses among the eight (or seven) required courses. The Department of Mathematics is expanding its program in statistics to make it possible for majors in mathematics to specialize in statistics and probability. The prefix STAT rather than MATH is used to designate these courses.

Students intending to major in mathematics should complete the lower division course work with an average grade of at least B.

A grade of at least C must be attained in each of the upper division mathematics courses presented to fulfill the requirements for a major in mathematics. In addition, at least two of these courses must be completed with grades of at least B.

Mathematics majors are required to take a minimum of 10 hours of Physics. This will consist of PHYS 020, 021 (5, 5) or PHYS 015, 016, 017 (4, 4, 4) or an acceptable equivalent. In addition, each student must select a supporting area outside of the Department of Mathematics in which he will take a minimum of 12 credits, at least six of which will be in one department at the 100-level. The average grade for courses in the supporting area must be at least C.

Since departmental requirements for majors are changed from time to time, each student is urged to consult his adviser to obtain the most recent requirements. Each student's program must be approved by his mathematics department adviser.

Since most of the non-English mathematical literature is written in French, German or Russian, the Foreign Language requirement should be met in one of these languages.

HONORS IN MATHEMATICS

The honors program is designed for students showing exceptional ability and interest in mathematics. Its aim is to give a student the best possible mathematical education. Participants are selected by the Honors Committee of the Department of Mathematics on the basis of recommendations from high school teachers and members of the faculty.

Wherever possible, honors students are placed in special mathematics courses, or in special sections of regular courses. Independent work is encouraged and can be done in place of formal course work. A final written and oral comprehensive examination in mathematics is given at the end of the program.

Introductory Mathematics Courses

Beginning students normally enroll in one of the courses MATH 003, 010, 018 or 019. A student may enroll in any one of these courses if he has the necessary high school mathematics and a suitable score on the mathematics section of the general classification test.

Students interested in majoring in mathematics or the physical or engineering sciences are urged to begin their Mathematics with MATH 018 or MATH 019. MATH 018 is open to students who offer for entrance two and one-half years of college preparatory mathematics. MATH 019 is open to students who

offer for entrance three and one-half years of college preparatory mathematics, including a course in trigonometry.

Students whose curriculum calls for MATH 003, 010 or 018 and who do not have the necessary prerequisites should enroll in MATH 001.

In general, students should enroll in only one of the course sequences MATH 010-011-014-015, MATH 018-019-020-021-022. In case this rule is not followed, proper assignment of credit will be made on application to the Department of Mathematics.

MATH 001. REVIEW OF HIGH SCHOOL ALGEBRA. (0)

Recommended for students who fail the qualifying examination for MATH 010, MATH 003 and MATH 018. Special fee of \$45. (Sorensen)

MATH 003. FUNDAMENTALS OF MATHEMATICS. (4)

Prerequisite, satisfactory performance on the SAT mathematics test, or MATH 001. This course is designed to provide an introduction to mathematical thinking, stressing ideas rather than techniques. Where possible, connections are drawn with other disciplines, such as philosophy, logic and art. (Douglass)

MATH 010, 011. INTRODUCTION TO MATHEMATICS. (3, 3)

Prerequisite, $2\frac{1}{2}$ years of college preparatory mathematics and satisfactory performance on the SAT mathematics test, or MATH 001. Open to students not majoring in mathematics or the physical or engineering sciences. Logic, sets, counting, probability; sequences, sums; elementary algebraic and transcendental functions and their geometric representation; systems of linear equations, vectors, matrices. (Good)

MATH 014, 015. ELEMENTARY CALCULUS (3, 3)

Prerequisite, MATH 011 or equivalent. Open to students not majoring in mathematics or the physical or engineering sciences. Basic ideas of differential and integral calculus; elementary techniques and applications. (Bernhardt)

MATH 018. INTRODUCTORY ANALYSIS. (3)

(2 lectures, 2 drill periods per week.) Prerequisite, $2\frac{1}{2}$ years of college preparatory mathematics and an appropriate score on the SAT mathematics test, or MATH 001. An introductory course for students not qualified to start MATH 019. Real numbers, functions, coordinate systems. Trigonometric functions. Plane analytic geometry. (Cook)

MATH 019. ANALYSIS I. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, $3\frac{1}{2}$ years of college preparatory mathematics or MATH 018. Sets and inequalities, Cartesian coordinates in the plane, the straight line, the circle, translation of coordinate axes, functions and their graphs, limits, continuity, the derivative and application of the derivative, antiderivatives, definite integral. (Goldberg)

MATH 020. ANALYSIS II. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 019 or equivalent. Applications of integration, techniques of integration, polar coordinates, basic properties of the elementary functions, improper integrals and indeterminate forms. (Helzer)

MATH 021. ANALYSIS III. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 020 or equivalent. Solid analytic geometry, sequences, infinite series, partial differentiation and multiple integration. (Greenberg)

MATH 022. ANALYSIS IV. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 021 or equivalent. Basic concepts of linear algebra, matrices and determinants. Calculus of function of vectors, implicit function theorem, surface integrals, classical theorems of Green, Gauss, and Stokes. (Horvath)

MATH 030. ELEMENTS OF MATHEMATICS. (4)

Prerequisite, one year of college preparatory algebra. Required for majors in elementary education, and open only to students in this field. Topics from algebra and number theory, designed to provide insight into arithmetic: inductive proof, the natural number system based on the Peano axioms; mathematical systems, groups, fields; the system of integers; the system of rational numbers; congruence, divisibility; systems of numeration. (Garstens)

MATH 031. ELEMENTS OF GEOMETRY. (4)

Prerequisite, MATH 030 or equivalent. Structure of mathematics systems, algebra of sets, geometrical structures, logic, measurement, congruence, similarity, graphs in the plane, geometry on the sphere. (Garstens)

MATH 050. CALCULUS I. (Honors) (4)

Prerequisite, approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 051. CALCULUS II. (Honors) (4)

Prerequisite, approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 052. CALCULUS III. (Honors) (4)

Prerequisite, approval of department. Elements of linear algebra, Euclidean and other metric spaces; Multi-variable calculus; implicit function theorem; theorems of Green, Gauss and Stokes. Riemann Stieltjes integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

MATH 053. CALCULUS IV. (Honors) (4)

Prerequisite, approval of department. Elements of linear algebra, Euclidean and other metric spaces; Multi-variable calculus; implicit function theorem; theorems of Green, Gauss and Stokes. Riemann Stieltjes integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

MATH 066. DIFFERENTIAL EQUATIONS FOR SCIENTISTS AND ENGINEERS. (3)

Prerequisite, MATH 021 or equivalent. Exact solutions for first order equations; basic theory, techniques, and applications of linear systems and higher order linear equations; power series solutions; Laplace transform solutions. (Strauss)

STAT. 050. INTRODUCTION TO RANDOM VARIABLES. (3)

Prerequisite, MATH 015 or MATH 021. Introductory mathematical concepts. Probabilistic concepts. Basic properties of probability. Discrete random variables and their distributions. Continuous variables (intuitive analytic approach). Joint distributions and transformations. Moments and moment generating functions. Law of large numbers and de Moivre's theorem. (Syski)

Courses 100-199

Algebra and Number Theory. 100, 101, 103, 104, 106, 107

Analysis. 110, 112, 113, 114, 117, 118, 119

Geometry and Topology. 120, 121, 122, 123, 124, 126, 128

Foundations of Mathematics. 144, 146, 147, 148

Applied Mathematics. 101, 162, 163, 164, 165, 168, 170, 171

Courses for Teachers of Mathematics and Science. 181, 182, 183, 184, 185, 189

Seminars, Selected Topics, Research. 190, 191

Statistics and Probability. STAT 100, 101, 110, 111, 120, 121, 150, 164, 170

MATH 100. VECTORS AND MATRICES. (3)

Prerequisite, MATH 021 or MATH 015. Algebra of vector spaces and matrices. Recommended for students interested in the applications of mathematics. (Not for graduate credit in mathematics.) (Schneider)

MATH 101. APPLIED LINEAR ALGEBRA. (3)

Prerequisite, MATH 100, or consent of the instructor. Various applications of linear algebra: theory of finite games, linear programming, matrix methods as applied to Finite Markov chains, random walk, incidence matrices, graphs and directed graphs, networks, transportation problems. (Pearl)

MATH 103. INTRODUCTION TO ABSTRACT ALGEBRA. (3)

Prerequisite, MATH 022 or equivalent. Integers; groups, rings, integral domains, fields. (Goldhaber)

MATH 104. INTRODUCTION TO LINEAR ALGEBRA. (3)

Prerequisite, MATH 103 or consent of instructor. An abstract treatment of finite dimensional vector spaces. Linear transformations and their invariants. (Timsans)

MATH 106. INTRODUCTION TO NUMBER THEORY. (3)

Prerequisite, MATH 022. Rational integers, divisibility, prime numbers, modules and linear forms, unique factorization theorem, Euler's function, Mobius' function, cyclotomic polynomial, congruences and quadratic residues, Legendre's and Jacobi's symbol, reciprocity law of quadratic residues, introductory explanation of the method of algebraic number theory. (Roselle)

MATH 107. THEORY OF QUADRATIC NUMBER FIELDS. (3)

Prerequisite, MATH 106 and MATH 103. Quadratic number fields, integers, ideals, units, ideal class groups, unimodular transformations and algorithms of the determination of ideal class groups and fundamental units, class number formula, Gauss' theory of genera and Kronecker's symbol. (Kuroda)

MATH 110. ADVANCED CALCULUS. (3)

Prerequisite, MATH 022. Real number system, open sets and compact sets on the real line, limits and continuity of real valued functions of one real variable, differentiation, functions of bounded variation, Riemann-Stieltjes integration, sequences and series of functions. (McGuinness)

MATH 112. INFINITE PROCESSES. (3)

Prerequisite, MATH 021 or equivalent. Construction of the real numbers from the rational numbers, sequences of numbers, series of positive and arbitrary numbers, infinite products, conditional and absolute convergence, sequences and series of functions, uniform convergence, integration and differentiation of series, power series, and analytic functions, Fourier series, elements of the theory of divergent series, extension of the theory to complex numbers and functions. (Kirwan)

MATH 113. INTRODUCTION TO COMPLEX VARIABLES. (3)

Prerequisite, MATH 119. The algebra of complex numbers, analytic functions mapping properties of the elementary functions. Cauchy's theorem and the Cauchy integral formula. Residues. (Credit will be given for only one of the courses MATH 113 and MATH 163.) (G. Lehner)

MATH 114. DIFFERENTIAL EQUATIONS. (3)

Prerequisite, MATH 110. A general introduction to the theory of differential equations. Constructive methods of solution leading to existence theorems and uniqueness theorems. Other topics such as: systems of linear equations, the behavior of solutions in the large, the behavior of solutions near singularities, periodic solutions, stability, and Sturm-Liouville problems. (Berg)

MATH 117. INTRODUCTION TO FOURIER ANALYSIS. (3)

Prerequisite, MATH 113. Fourier series. Fourier and Laplace transforms. (McGuinness)

MATH 118. INTRODUCTION TO REAL VARIABLES. (3)

Prerequisite, MATH 110. The Lebesgue integral. Fubini's theorem. Convergence theorems. The L_p spaces. (Neri)

MATH 119. SEVERAL REAL VARIABLES. (3)

Prerequisite, MATH 110. A brief review of scalar and vector valued functions of several real variables (as done in MATH 022). Implicit function theorem, change of variable theorem for multiple integrals, a detailed study of surfaces and surface integrals in n -dimensional Euclidean space, including integration by parts. Applications to partial differential equations and potential theory. (Brannan)

MATH 120. INTRODUCTION TO GEOMETRY I. (3)

Prerequisite, MATH 022 or consent of instructor. Axiomatic development of plane geometries, Euclidean and non-Euclidean. Groups of isometries and similarities. (Chu)

MATH 121. INTRODUCTION TO GEOMETRY II. (3)

Prerequisite, MATH 120. Non-Euclidean transformation groups, the Erlangen program, projective planes, cubics and quartics. (Reinhart)

MATH 122. INTRODUCTION TO POINT SET TOPOLOGY. (3)

Prerequisite, MATH 110 or 146, or equivalent. Connectedness, compactness, transformations, homeomorphisms; application of these concepts to various spaces, with particular attention to the Euclidean plane. (Dancis)

MATH 123. INTRODUCTION TO ALGEBRAIC TOPOLOGY. (3)

Prerequisite, MATH 103 and 122, or equivalent. Chains, cycles, homology groups for surfaces, the fundamental group. (Green)

MATH 124. INTRODUCTION TO PROJECTIVE GEOMETRY. (3)

Prerequisite, MATH 022 or equivalent. Recommended for students in the College of Education. Elementary projective geometry, combining synthetic algebraic approaches, projective transformations, harmonic division, cross ratio, projective coordinates, properties of conics. (Jackson)

MATH 126. INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3)

Prerequisite, MATH 022 or equivalent. The differential geometry of curves and surfaces, curvature and torsion, moving frames, the fundamental differential forms, intrinsic geometry of a surface. (Correl)

MATH 128. EUCLIDEAN GEOMETRY. (3)

Prerequisite, MATH 021 or consent of instructor. Recommended for students in the College of Education. Axiomatic method, models, properties of axioms; proofs of some basic theorems from the axioms; modern geometry of the triangle, circle, and sphere. (Reinhart)

MATH 144. RECURSIVE FUNCTION THEORY. (3)

Prerequisite, MATH 021 or consent of instructor. An informal development of propositional and predicate logic leading to a discussion of recursive functions, Turing machines, and finite automata. Topics include word problems, the classification of recursively enumerable sets, recursive reducibility.

(Karp)

MATH 146. FUNDAMENTAL CONCEPTS OF MATHEMATICS. (3)

Prerequisite, MATH 021 or consent of instructor. Sets, relations, mappings. Construction of the real number system starting with Peano postulates; algebraic structures associated with the construction; Archimedean order, sequential completeness and equivalent properties of ordered fields. Finite and infinite sets, denumerable and non-denumerable sets.

(Ehrlich)

MATH 147. AXIOMATIC SET THEORY. (3)

Prerequisite, MATH 103 or 146 or consent of instructor. Development of a system of axiomatic set theory, choice principles, induction principles, ordinal arithmetic including discussion of cancellation laws, divisibility, canonical expansions, cardinal arithmetic including connections with the axiom of choice, Hartog's theorem, König's theorem, properties of regular, singular, and inaccessible cardinals.

(Lopez-Escobar)

MATH 148. INTRODUCTION TO MATHEMATICAL LOGIC. (3)

Prerequisite, MATH 103 or 146 or 110. Formal propositional logic, completeness, independence, decidability of the system, formal quantificational logic, first-order axiomatic theories, extended Gödel Completeness theorem, Löwenheim-Skolem theorem, model-theoretical applications.

(Karp)

MATH 162. ANALYSIS FOR SCIENTISTS AND ENGINEERS I. (3)

Prerequisite, MATH 021 or consent of instructor. Credit will be given for only one of the courses MATH 022 and MATH 162. Calculus of functions of several real variables; limits, continuity, partial differentiation, multiple integrals, line and surface integrals, vector-valued functions, theorems of Green, Gauss and Stokes. Physical applications. (This course cannot be counted toward a major in mathematics.)

(Martin)

MATH 163. ANALYSIS FOR SCIENTISTS AND ENGINEERS II. (3)

Prerequisite, MATH 162 or 022 or consent of instructor. Credit will be given for only one of the courses MATH 113 or MATH 163. The complex field. Infinite processes for real and complex numbers. Calculus of complex functions. Analytic functions and analytic continuation. Theory of residues and application to evaluation of integrals. Conformal mapping. (This course cannot be counted toward a major in mathematics.)

(Sedgewick)

MATH 164. ANALYSIS FOR SCIENTISTS AND ENGINEERS III. (3)

Prerequisite, MATH 066 and MATH 163, or consent of instructor. Fourier and Laplace transforms. Evaluation of the complex inversion integral by the theory of residues. Applications to systems of ordinary and partial differential equations. (This course cannot be counted toward a major in mathematics.)

(Berg)

MATH 165. INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS. (3)

Prerequisites, MATH 110 or MATH 162. Topics will include one dimensional wave equation; linear second order equations in two variables, separations of variables and Fourier series; Sturm-Liouville theory.

(Mackie)

MATH 168. NUMERICAL METHODS FOR SCIENTISTS AND ENGINEERS. (3)

Prerequisite, MATH 022 or 162 and MATH 066. Interpolation, numerical differentiation and integration, numerical solution of polynomial and transcendental equations, least squares, systems of linear equations, numerical solution of ordinary differential equations, errors in numerical calculations. (This course cannot be counted toward a major in mathematics.) (Thaler)

MATH 170. NUMERICAL ANALYSIS I. (3)

Pre- or co-requisite, MATH 110. A thorough treatment of solutions of equations, interpolation and approximations, numerical differentiation and integration, numerical solution of initial value problems in the solutions of ordinary differential equations. (Vandergraft)

MATH 171. NUMERICAL ANALYSIS II. (3)

Prerequisite, MATH 100 or 104; pre- or co-requisite, MATH 110. The solution of linear systems by direct and iterative methods, matrix inversion, the evaluation of determinants, eigenvalues and eigenvectors of matrices. Application to boundary value problems in ordinary differential equations. Introduction to the numerical solution of partial differential equations. (Vandergraft)

MATH 181. INTRODUCTION TO NUMBER THEORY. (3)

Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. Axiomatic developments of the real numbers. Elementary number theory. (Staff)

MATH 182. INTRODUCTION TO ALGEBRA. (3)

Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. Modern ideas in algebra and topics in the theory of equations. (Staff)

MATH 183. INTRODUCTION TO GEOMETRY. (3)

Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. A study of the axioms for Euclidean and non-Euclidean geometry. (Staff)

MATH 184. INTRODUCTION TO ANALYSIS. (3)

Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. A study of the limit concept and the calculus. (Previous knowledge of calculus is not required.) (Staff)

MATH 185. SELECTED TOPICS FOR TEACHERS OF MATHEMATICS. (1-3)

Prerequisite, one year of college mathematics or consent of instructor. (Staff)

MATH 189. NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTE FOR TEACHERS OF SCIENCE AND MATHEMATICS. SEMINAR. (1-3)

Lectures and discussion to deepen the student's appreciation of mathematics as

a logical discipline and as a medium of expression. Special emphasis on topics relevant to current mathematical curriculum studies and revisions. (Staff)

MATH 190. HONORS SEMINAR. (2)

Prerequisite, permission of the departmental Honors Committee. Reports by students on mathematical literature; solution of various problems. (Brace)

MATH 191. SELECTED TOPICS IN MATHEMATICS. (VARIABLE CREDIT)

Prerequisite, permission of the instructor. Topics of special interest to advanced undergraduate students will be offered occasionally under the general guidance of the departmental Committee on Undergraduate Studies. Honors students register for reading courses under this number. (Brace)

STAT 100. APPLIED PROBABILITY AND STATISTICS I. (3)

Prerequisite, MATH 021. Basic concepts of probability. Random variables and distribution functions. Standard distributions. Moments. Conditional distributions and their moments. Sampling distributions. Laws of large numbers and Lindeberg-Levy's theorems. (Not for graduate credit in mathematics.) (Syski)

STAT 101. APPLIED PROBABILITY AND STATISTICS II. (3)

Prerequisite, STAT 100. Point estimation, sufficient unbiased and consistent estimators. Minimum variance and maximum likelihood estimators. Multivariate normal distribution. Sampling distributions. Interval estimation. Testing hypotheses. Regression and linear hypotheses. Experimental designs. Sequential tests, elements of nonparametric methods. (Not for graduate credit in mathematics.) (Connell)

STAT 110. INTRODUCTION TO PROBABILITY THEORY. (3)

Prerequisite, MATH 110 or if MATH 110 taken concurrently, STAT 050. Probability space and basic properties of probability measure. Random variables and their distribution functions, induced probability spaces. Multi-dimensional distribution functions. Characteristic functions. Limit theorems. (Syski)

STAT 111. INTRODUCTION TO STOCHASTIC PROCESSES. (3)

Prerequisite, STAT 110, or MATH 110 and STAT 050. Elementary stochastic processes. Renewal process random walks, branching process, discrete Markov chains, first passage times. Markov chains with a continuous parameter, birth and death processes. Stationary processes and their spectral properties. (Mikulski)

STAT 120. INTRODUCTION TO STATISTICS I. (3)

Prerequisite, STAT 110, or STAT 100 and MATH 110. Short review of probability concepts including sampling distributions. Interval estimation. Theory of order statistics. Tolerance limits. Limit distributions and stochastic convergence. Sufficient statistics. Completeness and stochastic independence. Rao-Blackwell theorem. (Rastogi)

STAT 121. INTRODUCTION TO STATISTICS II. (3)

Prerequisite, STAT 120, or STAT 101 and MATH 110. Loss and risk functions. Statistical decisions. Optimality criteria. Uniformly minimum risk procedures. Bayesian risk, minimax principle. Point, estimation theory. Statistical hypotheses and optimal tests. Likelihood ratio tests. Elements of linear hypotheses, analysis of variance and sequential theory. (Connell)

STAT 150. REGRESSION AND VARIANCE ANALYSIS. (3)

Prerequisite, STAT 101 or STAT 120. One, two, three and four way layouts in analysis of variance fixed effects models, linear regression in several variables, Gauss-Markov-theorem, multiple regression analysis, experimental designs.

(Mikulski)

STAT 164. INTRODUCTION TO BIOSTATISTICS. (3)

Prerequisite, one semester of calculus and junior standing. Probabilistic models. Sampling. Some applications of probability in genetics. Experimental designs. Estimation of effects of treatment. Comparative experiments. Fisher-Irwin test. Wilcoxon tests for paired comparisons.

(Syski)

STAT 170. LINEAR AND NONLINEAR PROGRAMMING. (3)

Prerequisite, MATH 021 or MATH 100. Duality theorem and minimax theorem for finite matrix games. Structure of linear and nonlinear solutions with perturbations. Various solution techniques of linear, quadratic, and convex programming methods. Special integer programming models (transportation and traveling salesman problems). Network theory with max-flow-min-cut theorem.

(Mikulski)

Courses 200-399

Algebra. 200, 201, 202, 203, 206, 207, 208, 209, 271, 290, 291

Analysis. 212, 215, 216, 218, 219, 272, 278, 280, 281, 286, 287, 288, 289

Geometry and Topology. 204, 205, 221, 222, 223, 224, 225, 226, 227, 228, 229, 273, 290, 291

Applied and Numerical Mathematics. 252, 255, 256, 257, 258, 259, 261, 262, 263, 264, 265, 266, 267, 268, 269, 274

Statistics and Probability. 230, 231, 232, 235, 236, 237, 238, 275, 276

Logic and Foundations. 240, 244, 277, 298

Research. 399

MATH 200. ABSTRACT ALGEBRA I. (3)

Prerequisite, MATH 104 or equivalent. Elementary properties and examples of groups and rings, homomorphism theorems; integral domains, elementary factorization theory. Groups with operators; isomorphism theorems, normal series, Jordan-Holder theorem, direct products, Krull-Schmidt theorem.

(Roselle)

MATH 201. ABSTRACT ALGEBRA II. (3)

Prerequisite, MATH 200 or consent of instructor. Field theory, Galois theory. Commutative ideal theory. Multilinear algebra.

(Wagner)

MATH 202. HOMOLOGICAL ALGEBRA. (3)

Projective and injective modules, homological dimensions, derived functors, spectral sequence of a composite functor. Applications.

(Holzsager)

MATH 203. COMMUTATIVE ALGEBRA. (3)

Ideal theory of Noetherian rings, valuations, localizations, complete local rings, Dedekind domains.

(Helzer)

MATH 204, 205. TOPOLOGICAL GROUPS. (3, 3)

Prerequisite, consent of instructor. An introductory course in abstract groups, topological spaces, and the study of collections of elements enjoying both these properties. The concept of a uniform space will be introduced and studied. The representation problem will be considered together with the subject of Lie groups.

(Kleppner)

MATH 206. ALGEBRAIC NUMBER THEORY I. (3)

Prerequisite, MATH 200 or tentatively by consent of instructor. Algebraic numbers and algebraic integers, algebraic number fields of finite degree, ideals and units, fundamental theorem of algebraic number theory, theory of residue classes. Minkowski's theorem on linear forms, class numbers, Dirichlet's theorem on units, relative algebraic number fields, decomposition group, inertia group, and ramification group, of a prime ideal with respect to a relative Galois extension. (Kuroda)

MATH 207. ALGEBRAIC NUMBER THEORY II. (3)

Prerequisite, MATH 206, MATH 200 or equivalent. Valuation of a field, algebraic function fields, completion of a valuation field, ramification exponent and residue class degree, ramification theory, elements, differentials, discriminants, product formula and characterization of fields by the formula, Gauss sum, class number formula of cyclotomic fields. (Kuroda)

MATH 208. RING THEORY. (3)

Prerequisite, MATH 201 or consent of instructor. According to the needs of the class, emphasis will be placed on one or more of the following: ideal theory, structure theory of rings with or without minimum condition, division rings, algebras, non-associative rings. (Pearl)

MATH 209. GROUP THEORY. (3)

Prerequisite, MATH 201 or consent of instructor. According to the needs of the class, emphasis will be placed on one or more of the following aspects of discrete group theory: finite groups, Abelian groups, free groups, solvable or nilpotent groups, groups with operators, groups with local properties, groups with clan conditions, extensions. (Pearl)

MATH 212. SPECIAL FUNCTIONS. (3)

Prerequisite, MATH 287 or consent of instructor. Gamma-function, Riemann zeta-function, hypergeometric functions, confluent hypergeometric functions and Bessel functions. (Stellmacher)

MATH 215, 216. ADVANCED ORDINARY DIFFERENTIAL EQUATIONS. (3, 3)

Prerequisite, MATH 104, 286. Existence and uniqueness theorems. Linear systems. Autonomous systems in the plane. Nonlinear systems. Asymptotic behavior of solutions. (Wolfe)

MATH 218, 219. FUNCTIONAL ANALYSIS. (3, 3)

Prerequisite, MATH 286, 287. Normed linear spaces including Banach and Hilbert spaces, linear operators and their spectral analysis, with application to differential and integral equations. (Goldberg)

MATH 221. DIFFERENTIABLE MANIFOLDS. (3)

Prerequisite, consent of instructor. Differentiable manifolds, embeddings in Euclidean space, vector and tensor bundles, vector fields, differentiable fields. Riemann metrics. (Chu)

MATH 222. DIFFERENTIAL GEOMETRY. (3)

Prerequisite, MATH 221. Connections, curvature, torsion: symplectic contact, and complex structures. (Reinhart)

MATH 223, 224. ALGEBRAIC TOPOLOGY. (3, 3)

Prerequisites, MATH 100 and 123, or consent of instructor. Homology, cohomology, and homotopy theory of complexes and spaces. (G. Lehner)

MATH 225, 226. SET THEORETIC TOPOLOGY. (3, 3)

Prerequisite, concurrent enrollment in MATH 286 or equivalent. Foundations of mathematics based on a set of axioms, metric spaces, convergence and con-

nectivity properties of point sets, continua, and continuous curves; the topology of the plane. (Correl)

MATH 227, 228. ALGEBRAIC GEOMETRY. (3, 3)

Prerequisite, consent of instructor. Prime and primary ideals in Noetherian rings, Hilbert Nullstellensatz, places and valuations, fields of definitions, Chow points, birational correspondences, Abelian varieties, Picard varieties, algebraic groups. (Horvath)

MATH 229. DIFFERENTIAL TOPOLOGY. (3)

Prerequisite, MATH 221. Characteristic classes, cobordism, differential structures on cells and spheres. (Chu)

MATH 230, 231. PROBABILITY THEORY. (3, 3)

Prerequisite, STAT 110, or MATH 100 and one semester of probability theory. Foundations of probability theory. Fields of events, probability spaces and probability measure. Random variables and convergence of random variables. Induced probability spaces. Expectations and moments. Distribution functions and their transforms. Consistency theorem. Laws of large numbers and central limit problem. Conditioning. Measurability and separability of stochastic processes. Stationary processes, harmonic analysis, Markov process, Kolmogorov equations; diffusion theory. Martingales. (Syski)

MATH 232. APPLIED STOCHASTIC PROCESSES. (3)

Prerequisites, STAT 110, or MATH 100 and one semester of probability theory. Basic concepts of stochastic processes, stationary processes, Markov chains and processes (discrete and continuous parameter). Birth and death processes. Applications from theories of: queuing, storage, inventory, noise, epidemics and others. This course is recommended for graduates from Physics, Engineering, Biology and Social Sciences. (Connell)

MATH 235, 236. TESTING STATISTICAL HYPOTHESES. (3, 3)

Prerequisite, STAT 121. Statistical decision problems. Uniformly most powerful tests. Exponential families of distributions, concepts of similarity and tests with Neyman-structure. Unbiased tests. Invariance and almost invariance. Elements of non-parametric inference. Linear hypotheses. Large sample methods. (Daniel)

MATH 237. MATHEMATICAL STATISTICS I. (3)

Prerequisites, STAT 110, or STAT 101 and MATH 110. Random variables and special distributions. Expectation, moments, characteristic functions. Multivariate distributions, sampling distributions, limiting theorems. Transformations order statistics, series representations. Estimation, Cramer-Rao inequality, maximum likelihood. Gauss-Markov theorem, and Bayes estimates. (Mikulski)

MATH 238. MATHEMATICAL STATISTICS II. (3)

Prerequisite, STAT 120. Tests of hypotheses, Neyman-Pearson lemma and likelihood ratio tests. Bayesian inference. Goodness of fit and contingency tables. Regression and analysis of variance. Non-parametric tests. Other topics from among the following: sequential analysis, multivariate analysis, principal components, decision functions. (Syski)

MATH 240. CONSISTENCY PROOFS IN SET THEORY. (3)

Prerequisite, MATH 147 and 148. Consistency and independence of such fundamental principals of set theory as the laws of choice, of cardinal arithmetic of constructability and regularity. Godel's model of constructible sets, inner models, Cohen's generic models. (Karp)

MATH 244. MATHEMATICAL LOGIC. (3)

Prerequisite, MATH 148. Completeness of first-order predicate logic and applications, recursive functions, Godel's incompleteness theorem.

(Lopez-Escobar)

MATH 250, 251. EIGENVALUE AND BOUNDARY VALUE PROBLEMS. (3, 3)

Prerequisite, MATH 110. Linear analysis and applications to modern applied mathematics. Among the topics to be covered are normed spaces, integral equations, spectral theory of compact operators and application to ordinary and partial differential equations, and variational methods for approximate solutions. The central theme of the course will be the theory of compact operators and its application to boundary and eigenvalue problems. The first semester will include integral equations and ordinary differential equations. The second semester will treat partial differential equations.

(Kellogg)

MATH 252. VARIATIONAL METHODS. (3)

Prerequisites, MATH 250 and 258. The Euler-Lagrange equation, minimal principles in mathematical physics, estimation of capacity, torsional rigidity and other physical quantities; symmetrization, isoperimetric inequalities, estimation of eigenvalues, the minimax principle.

(Trytten)

MATH 255, 256. ADVANCED NUMERICAL METHODS IN DIFFERENTIAL EQUATIONS. (3, 3)

Prerequisites, MATH 250 and 265. Approximation methods for boundary value, initial value and eigenvalue problems in both ordinary and partial differential equations, including finite differences and methods involving approximating functions.

(Hubbard)

MATH 258. INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS. (3)

Prerequisite, MATH 110. General introduction to the field of partial differential equations. Among the topics to be discussed are typical boundary and initial value problems of mathematical physics and an indication of the main methods of solution, relations to difference equations and integral equations.

(Nieto)

MATH 259. INTRODUCTION TO CONTINUUM MECHANICS. (3)

Prerequisites, MATH 100 and 258 or consent of instructor. Solid and fluid continua, general analysis of stress and strain, equilibrium of elastic bodies, equation of motion for fluid bodies, stress-strain relations, equations of perfect fluids and formulation of viscous flow problems.

(Staff)

MATH 261, 262. FLUID DYNAMICS. (3, 3)

Prerequisite, MATH 259 or consent of instructor. A mathematical formulation and treatment of problems arising in the theory of incompressible, compressible and viscous fluids.

(Mackie)

MATH 263. LINEAR ELASTICITY. (3)

Prerequisite, MATH 259. Linear elastic behavior of solid continuous media. Topics covered include torsion and flexure of beams, plane strain and plane stress, vibration and buckling problems, variational principles. Emphasis is placed on formulation and technique rather than on specific examples.

(Staff)

MATH 264. NON-LINEAR ELASTICITY. (3)

Prerequisite, MATH 259. Fundamentals of non-linear elasticity, finite deformations, rubber elasticity, small deformations superimposed on finite deformations.

(Staff)

MATH 265. PARTIAL DIFFERENTIAL EQUATIONS. (3)

Prerequisite, MATH 258. Two variables, Cauchy's problem, characteristics, Riemann's method, properties of the Riemann function, quasi-linear equations and canonical hyperbolic systems, wave equation in n -dimensions, method of Hadamard and Riesz, Euler-Poisson equation and the singular problems, Huyghen's principle. (Douglass)

MATH 266. ELLIPTIC DIFFERENTIAL EQUATIONS. (3)

Prerequisite, MATH 258. The equations of Laplace and Poisson, flux, the theorems of Gauss and Green, potentials of volume and surface distributions, harmonic functions, Green's function and the problems of Dirichlet and Neumann; linear elliptic equations with variable coefficients, in particular the equations of Stokes and Beltrami; fundamental solutions, the principle of the maximum, and boundary value problems; introduction to the theory of non-linear equations. (Stellmacher)

MATH 267, 268. MODERN NUMERICAL MATHEMATICS. (3, 3)

Prerequisites, MATH 170 and 250. Review of classical numerical analysis, matrix computations in particular numerical evaluation of eigenvalues, interactive techniques from a viewpoint of linear analysis: introduction to numerical approximations; error analysis in numerical computation. The course will involve laboratory work in the Computer Science Center. (Rheinboldt)

MATH 269. ADVANCED MATHEMATICAL PROGRAMMING. (3)

Prerequisites, STAT 111 and STAT 170, or consent of instructor. Linear inequalities and related systems and their applications to linear programming, convex functions, and generalized programming problems, topics in non-linear and dynamics programming. (Daniel)

MATH 271. SELECTED TOPICS IN ALGEBRA. (3)

Prerequisite, consent of instructor. (Staff)

MATH 272. SELECTED TOPICS IN ANALYSIS. (3)

Prerequisite, consent of instructor. (Staff)

MATH 273. SELECTED TOPICS IN GEOMETRY AND TOPOLOGY. (3)

Prerequisite, consent of instructor. (Staff)

MATH 274. SELECTED TOPICS IN APPLIED MATHEMATICS. (3)

Prerequisite, consent of instructor. (Staff)

MATH 275. SELECTED TOPICS IN PROBABILITY. (3)

Prerequisite, consent of instructor. (Staff)

MATH 276. SELECTED TOPICS IN STATISTICS. (3)

Prerequisite, consent of instructor. (Staff)

MATH 277. SELECTED TOPICS IN MATHEMATICAL LOGIC. (3)

(Arranged) Prerequisite, consent of instructor. (Staff)

MATH 278. ADVANCED TOPICS IN COMPLEX ANALYSIS. (3)

Prerequisite, consent of instructor. (Staff)

MATH 280, 281. LINEAR SPACES. (3, 3)

Prerequisite, MATH 218. Linear topological spaces, locally convex spaces, duality theory, distributions. (Ellis)

MATH 286. REAL ANALYSIS I. (3)

Prerequisite, MATH 110 or equivalent. Sets. Metric spaces. Lebesgue measure and integration. Differentiation. Introduction to Banach and Hilbert spaces. (Osborn)

MATH 287. COMPLEX ANALYSIS I. (3)

Prerequisite, Math 110 or equivalent. Linear transformation, analytic functions, conformal mappings, Cauchy's theorem and applications, power series, partial fractions and factorization, elementary Riemann surfaces, Riemann's mapping theorem. (Gulick)

MATH 288. COMPLEX ANALYSIS II. (3)

Prerequisite, MATH 286, 287. Topics in conformal mappings, normal families, Picard's theorem, classes of univalent functions, extremal properties, variational methods, elliptic functions, Riemann surfaces. (Kirwan)

MATH 289. REAL ANALYSIS II. (3)

Prerequisite, MATH 286, 287. General topology. Measure theory. L_p spaces. Fourier transforms. Locally compact spaces. (Benedetto)

MATH 290, 291. LIE GROUPS. (3, 3)

Some of the following topics will be emphasized: groups of matrices, solvable Lie groups, compact Lie groups, classification of semi-simple Lie groups, representation theory, homogeneous spaces. (Staff)

MATH 298. PRO-SEMINAR IN RESEARCH. (1)

Prerequisite, one semester of graduate work in mathematics. A seminar devoted to the foundations of mathematics, including mathematical logic, axiom systems, and set theory. (Auslander)

MATH 399. RESEARCH.

(Arranged)

(Staff)

MICROBIOLOGY

Professor and Chairman: FABER.

Professors: HANSEN, PELCZAR, DOETSCH AND LAFFER.

Associate Professor: HETRICK.

Assistant Professors: MACQUILLAN, ROBERSON, COOK AND KAPLAN.

Instructor: VAITUZIS.

Lecturer: STADTMAN.

The Department of Microbiology has as its primary aim providing the student with thorough and rigorous training in microbiology. This entails knowledge of the basic concepts of bacterial cytology, physiology, taxonomy, and genetics, as well as an understanding of the biology of infectious disease, immunology, general virology, and various applications of microbiological principles to public health and industrial processes. In addition, the Department pursues a broad and vigorous program of basic research, and encourages original thought and investigation in the above mentioned areas.

The Department also provides desirable courses for students majoring in allied departments who wish to obtain vital, supplementary information. Every effort has been made to present the subject matter of Microbiology as a basic core of material that is pertinent to all biological sciences.

MICROBIOLOGY CURRICULUM

The field of microbiology is such that an intensive study of it presupposes a broad undergraduate curriculum and does not begin until the student begins

his graduate career. Accordingly, the curriculum outlined below, which leads to a B.S. degree, includes the basic courses in microbiology and allied fields.

A student planning a major in microbiology should consult his adviser during the first year. The supporting courses should be chosen only from the biological or physical sciences.

No course with a grade less than "C" may be used to satisfy major requirements.

The Department has an Honors Program and information concerning this program may be obtained from the Department.

Courses required in major, and supporting courses: MICB 001—General Microbiology (4), MICB 081—Applied Microbiology (4), MICB 101—Pathogenic Microbiology (4), MICB 103—Immunology (4), MICB 111—General Virology (4), MICB 151—Microbial Physiology (4), MICB 160—Systematic Bacteriology (2), MICB 162—Microbiological Literature (1), CHEM 001, 003—General Chemistry (4, 4), CHEM 031, 033—Elements of Organic Chemistry (3, 3), CHEM 019—Elements of Quantitative Analysis (4) or MATH 014, 015—Elementary Calculus (3, 3), CHEM 161, 163—Biochemistry (2, 2), MATH 010, 011—Introduction to Mathematics (3, 3), PHYS 010, 011—Fundamentals of Physics (4, 4).

Certain closely related and relevant courses offered by other academic departments may be substituted for those specified in the major requirements, provided prior approval is obtained in each case.

MICB 001. GENERAL MICROBIOLOGY. (4)

First and second semesters. Summer session. Prerequisite, two semesters of chemistry. Two lectures and two two-hour laboratory periods a week. The physiology, culture and differentiation of microorganisms. Fundamental principles of microbiology in relation to man and his environment. (Cook)

MICB 081. APPLIED MICROBIOLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 001. The application of microorganisms and microbiological principles to milk, dairy products, and foods, industrial processes; soil; water and sanitation operations. (Kaplan)

For Advanced Undergraduates and Graduates

MICB 101. PATHOGENIC MICROBIOLOGY. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 001. The role of microorganisms in the diseases of man and animals with emphasis upon the differentiation and culture of microorganisms, types of disease, modes of disease transmission, prophylactic, therapeutic and epidemiological aspects. (Roberson)

MICB 103. IMMUNOLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 101. Infection and resistance; principles and types of immunity; hypersensitiveness. Fundamental techniques of major diagnostic immunological reactions and their application. (Roberson)

MICB 104. HISTORY OF MICROBIOLOGY. (1)

First semester. One lecture period a week. Prerequisite, a major or minor in microbiology. History and integration of the fundamental discoveries of the

science. The modern aspects of cytology, taxonomy, fermentation, and immunity in relation to early theories. (Doetsch)

MICB 108. EPIDEMIOLOGY AND PUBLIC HEALTH. (2)

Second semester. Two lecture periods a week. Prerequisite, MICB 001. History, characteristic features, and epidemiology of the important communicable diseases, public health administration and responsibilities; vital statistics. (Faber)

MICB 111. GENERAL VIROLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 101 or equivalent. Basic concepts regarding the nature of viruses and their properties, together with techniques for their characterization and identification. (Hetrick)

MICB 121. MICROBIAL FERMENTATIONS. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, consent of instructor. The application of quantitative techniques for measurement of enzyme reactions, mutations, fermentation, analyses, and other physiological processes of microorganisms. (Cook)

MICB 135. APPLIED MICROBIOLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisites, MICB 001, CHEM 031, and CHEM 033. Introduction to the chemical activities of microorganisms and their industrial application. (MacQuillan)

MICB 151. MICROBIAL PHYSIOLOGY. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisites, 8 credits in microbiology and CHEM 031, 033, or equivalent. Aspects of the growth, death, and energy transactions of microorganisms are considered, as well as the effects of the physical and chemical environment on them. (MacQuillan)

MICB 160. SYSTEMATIC BACTERIOLOGY. (2)

First semester. Two lecture periods a week. Prerequisite, 8 credits in microbiology. History of bacterial classification; genetic relationships; international codes of nomenclature; bacterial variation as it affects classification. (Hansen)

MICB 162. MICROBIOLOGICAL LITERATURE. (1)

Second semester. One lecture period a week. Prerequisite, a major in microbiology. Introduction to periodical literature, methods, interpretation and presentation of reports. (Doetsch)

MICB 181. MICROBIOLOGICAL PROBLEMS. (3)

First and second semesters. Summer session. Prerequisite, 16 credits in microbiology. Registration only upon the consent of the instructor. This course is arranged to provide qualified majors in microbiology and majors in allied fields an opportunity to pursue specific microbiological problems under the supervision of a member of the Department. (Faber)

For Graduates

MICB 201. MEDICAL MYCOLOGY. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, 30 credits in microbiology and allied fields. Primarily a study of the fungi associated with disease and practice in the methods of isolation and identification. (Laffer)

MICB 202. GENETICS OF MICROORGANISMS. (2)

Second semester. Two lecture periods a week. Prerequisite, consent of instructor. An introduction to genetic principles and methodology applicable to microorganisms. Spontaneous and induced mutation, interaction between clones. (Hansen)

MICB 204. BACTERIAL METABOLISM. (2)

Second semester. Two lecture periods a week. Prerequisite, 30 credits in microbiology and allied fields, including CHEM 161 and 163. Bacterial nutrition, enzyme formation, metabolic pathways and the dissimilation of carbon and nitrogen substrates. (MacQuillan)

MICB 206, 208. SPECIAL TOPICS. (1-4, 1-4)

First and second semesters. Prerequisite, 20 credits in microbiology. Presentation and discussion of fundamental problems and special subjects in the field of microbiology. (Staff)

MICB 210. VIROLOGY AND TISSUE CULTURE. (2)

Second semester. Two lecture periods a week. Prerequisite, MICB 101 or equivalent. Characteristics and general properties of viruses and rickettsiae. Principles of tissue culture. (Hetrick)

MICB 211. VIROLOGY AND TISSUE CULTURE LABORATORY. (2)

Second semester. Two three-hour laboratory periods a week. Prerequisite, MICB 101 or equivalent. Registration only upon consent of instructor. Laboratory methods in virology and tissue culture. (Hetrick)

MICB 214. ADVANCED BACTERIAL METABOLISM. (1)

Second semester. One lecture period a week. Prerequisite, MICB 204 or consent of instructor. A discussion of recent advances in the field of bacterial metabolism with emphasis on metabolic pathways of microorganisms. (Stadtman)

MICB 271. CYTOLOGY OF BACTERIA. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, consent of instructor. A consideration of morphology, differentiation, and cyto-chemistry of eubacterial organism. (Doetsch)

MICB 280. SEMINAR-RESEARCH METHODS. (1)

First semester. Discussions and reports prepared by majors in microbiology engaged in current research; presentation of selected subjects dealing with recent advances in microbiology. (Staff)

MICB 282. SEMINAR-MICROBIOLOGICAL LITERATURE. (1)

Second semester. Presentation and discussion of current literature in microbiology. (Staff)

MICB 399. RESEARCH. (VAR.)

First and second semesters. Summer session. Credits according to work done. The investigation is outlined in consultation with and pursued under the supervision of a senior staff member of the Department. (Staff)

MOLECULAR PHYSICS

Professor and Director: VANDERSLICE.

Professors: BENESCH, ZWANZIG.

Visiting Research Professor: BENEDICT.

Associate Professors: DE ROCCO, KRISHER.

Assistant Professors: GINTER, MUNN, SPAIN, VERBEKE.

The Institute for Molecular Physics, a department in the College of Arts and Sciences, comprises a faculty interested in theoretical and experimental studies in the general area of molecular interaction. The Institute thus serves as an ideal place to bring together physicists and chemists to work on problems of mutual interest to the advantage of both, and the faculty is made up of members of each of these disciplines. Since the faculty of the Institute feels strongly that students should fulfill the undergraduate requirements in one of the traditional departments to insure a broad background in a fundamental subject, no undergraduate degree is offered. Members of the Institute teach both undergraduate and graduate courses in the Department of Chemistry and the Department of Physics and Astronomy and supervise thesis research of graduate students in these departments. The Institute also participates in a graduate degree program in Chemical Physics which is jointly administered by the Institute, the Department of Chemistry, and the Department of Physics and Astronomy. This program is described in the Graduate School catalog.

MUSIC

Professor and Chairman: ULRICH.

Professors: GRENTZER, McCORKLE, AND TRIMBLE.

Associate Professors: BERMAN, BERNSTEIN, DE VERMOND, GORDON, HEIM, JOHNSON, MEYER, NOSSAMAN, PENNINGTON, SPRINGMANN, AND TRAVER.

Assistant Professors: DIEMER, BLUM, GARVEY, HALEY, HEAD, McCLELLAND, MONTGOMERY, OSTLING, PAYERLE, REGER, SHELLEY, AND WINDEN.

Instructors: ALLGOOD, ATHERTON, BARNETT, BEATTY, DICKEY, FANOS, GALLAGHER, LUNDE, LUNDSTROM, OLSON, SHREIBER, SKIDMORE, TATNALL, WACHHAUS, AND WAKEFIELD.

The functions of the Department are (1) to help the general student develop sound critical judgment and discriminating taste in the art of music; (2) to provide professional training based on a foundation in the liberal arts; (3) to prepare the student for graduate work in the field; and (4) to prepare him to teach in the public schools. To this end, two degrees are offered: the Bachelor of Music, with a major in theory and composition, history and literature, or applied music; and the Bachelor of Arts, with a major in music. The Bachelor of Science degree, with a major in music education, is offered in the College of Education; this program, however, is administered within the Music Department.

Courses in music theory, literature, and applied music are open to all students who have completed the specified prerequisites or their equivalents. The University Bands, Chamber Chorus, Choir, Madrigal Singers, Men's Glee Club.

Orchestra, and Women's Chorus, as well as the smaller ensembles, are likewise open to qualified students.

THE BACHELOR OF MUSIC DEGREE

The curriculum leading to the degree of Bachelor of Music is designed for students who wish to prepare for music teaching on the college level. A list of specific courses is available in the Departmental office. A grade of C or above is required in each major course. The course requirements in the three major areas may be summarized as follows:

<i>Major in</i>	<i>Theory and Composition</i>	<i>History and Literature</i>	<i>Applied Music</i>
Academic Courses:			
Specified*	43 sem. hrs.	43 sem. hrs.	43 sem. hrs.
Unspecified	8	8	9
Theory and Literature:			
Lower Division	27	23	23
Upper Division	16	22	13
Applied Music:	26	24	32

In addition; eight semester hours in ensemble courses.

THE BACHELOR OF ARTS DEGREE

The curriculum leading to the Bachelor of Arts degree with a major in music is designed for students whose interests are cultural rather than professional. The departmental requirements include nineteen semester hours in music theory, eighteen semester hours in music history and literature, ten semester hours in applied music, in addition to one semester hour of ensemble credit for each semester in residence. A list of specific courses is available in the Departmental office. A grade of C or above is required in each major course.

MUSC 001. INTRODUCTION TO MUSIC. (3)

Open only to music or music education majors; other students take MUSC 020. MUSC 001 and 020 may not both be counted for credit. A study of the forms and styles of music, leading to an intelligent appreciation of the art and providing a foundation for more advanced courses in the Department of Music.

(Skidmore, Tatnall)

MUSC 004. MEN'S GLEE CLUB. (1)

Open to any student who can qualify. May be taken until a total of eight semester hours of credit has been earned; the music studied will cover a cycle of about eight semesters.

(Traver)

MUSC 005. WOMEN'S CHORUS. (1)

Open to any student who can qualify. May be taken until a total of eight semester hours of credit has been earned; the music studied will cover a cycle of about eight semesters.

(Traver)

*As specified in the General Education requirements and College requirements described elsewhere in this Bulletin. B.Mus. candidates will satisfy the General Education requirements in Fine Arts with MUSC 001; credit hours for this requirement are included under Theory and Literature—lower division—above. B.Mus. candidates are not required to satisfy the College requirement, SPCH 001.

MUSC 006. ORCHESTRA. (1)

Open to any student who can qualify. May be taken until a total of eight semester hours of credit has been earned; the music studied will cover a cycle of about eight semesters.
(Roger)

MUSC 007, 008. THEORY OF MUSIC. (3, 3)

Two lectures and three laboratory hours per week. A fundamental course in the elements of music. Study of rhythms, scales, chord structures, and tonalities through ear training, sight singing, and keyboard drill. The student must achieve a grade of C in MUSC 008 in order to register for MUSC 070.

(Payerle and Staff)

MUSC 009. CHAMBER MUSIC ENSEMBLE. (1)

This course does not fulfill the ensemble requirements of the various curricula. Three laboratory hours per week. Rehearsal and performance of selected works for small ensembles of strings, winds, and piano or small vocal ensembles. May be repeated for credit; the music studied will cover a cycle of about six semesters.
(Staff)

MUSC 010. BAND. (1)

Open to any student who can qualify. May be taken until a total of eight semester hours of credit has been earned; the music studied will cover a cycle of about eight semesters.
(Ostling, Wakefield)

MUSC 015. CHAPEL CHOIR. (1)

Open to all students in the University, subject to the Director's approval. May be taken until a total of eight semester hours of credit has been earned.

(Springmann)

MUSC 016. FUNDAMENTALS FOR THE CLASSROOM TEACHER. (3)

Open to students majoring in elementary education or childhood education; other students take MUSC 007. MUSC 007 and 016 may not both be counted for credit. The fundamentals of music theory and practice, related to the needs of the classroom and kindergarten teacher, and organized in accord with the six-area concept of musical learning.
(Fanos and Staff)

MUSC 020. SURVEY OF MUSIC LITERATURE. (3)

Three lectures and one laboratory hour per week. Open to all students except music and music education majors. MUSC 001 and 020 may not both be taken for credit. A study of the principles upon which music is based, and an introduction to the musical repertoires performed in America today.

(Gordon and Staff)

MUSC 021, 022. CLASS VOICE. (2, 2)

Four hours per week. A laboratory course in which a variety of voices and vocal problems are represented. Principles of correct breathing as applied to singing; fundamentals of tone production and diction. Students are taught to develop their own voices. Repertoire of folk songs and songs of the Classical and Romantic periods.
(Nossaman)

MUSC 023, 024. CLASS PIANO. (2, 2)

Four hours per week. Functional piano training for beginners. Development of techniques useful for school and community playing. Basic piano techniques; chord, arpeggio, and scale techniques; melody and song playing; simple accompaniments, improvisation for accompaniments and rhythms; sight reading and transposition, and playing by ear. MUSC 024, continuation of MUSC 023; elementary repertoire is begun.
(de Vermond)

MUSC 031, 032. ADVANCED CLASS VOICE. (2, 2)

Four hours per week. Prerequisite, MUSC 022 or equivalent vocal training.

Continuation of MUSC 022, with more advanced repertoire for solo voice and small ensembles. A special section for music-education majors will include the study of methods and materials for teaching class voice. (Pennington)

MUSC 033, 034. ADVANCED CLASS PIANO. (2, 2)

Four hours per week. Prerequisite, MUSC 024 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 024; transposition, modulation, and sight reading; methods of teaching functional piano. MUSC 034, development of style in playing accompaniments and in playing for community singing. More advanced repertoire. (de Vermond)

MUSC 061, 062, 063, 064, 065, 066, 067, 068. CLASS STUDY OF ORCHESTRAL AND BAND INSTRUMENTS. (2 each course)

First and second semesters alternately. Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on two to four instruments, and an understanding of the acoustical and construction principles of the others. MUSC 061, Violin; MUSC 062, Cello and Bass; MUSC 063, Clarinet; MUSC 064, Flute, Oboe, Bassoon, and Saxophone; MUSC 065, Cornet; MUSC 066, Horn, Trombone, Euphonium, and Tuba; MUSC 067, Percussion; MUSC 068, Advanced Strings. (Staff)

MUSC 070, 071. ADVANCED THEORY OF MUSIC. (4, 4)

Prerequisite, MUSC 008 with a grade of at least C. Three lectures and two laboratory hours per week. An integrated course of written harmony, keyboard harmony, and ear training. Continuation of the principles studied in MUSC 008 Harmonic progressions; MUSC 070, eighteenth-century chorale style; MUSC 071, nineteenth-century styles including chromatic and modulatory techniques. Realization of figured basses, and composition in the smaller forms. Advanced study of solfege, with drill in melodic, rhythmic, and harmonic dictation. Application of harmonic principles to the keyboard. (Payerle and Staff)

MUSC 080. CLASS STUDY OF STRING INSTRUMENTS. (2)

First semester. Open only to majors in music education (vocal option). Four laboratory hours per week. Basic principles of string playing, and a survey of all string instruments. (Berman)

MUSC 081. CLASS STUDY OF WIND AND PERCUSSION INSTRUMENTS. (2)

Second semester. Open only to majors in music education (vocal option). Four laboratory hours per week. A survey of wind and percussion instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on one instrument and gain an understanding of the acoustical and construction principles of the others. (Staff)

For Advanced Undergraduates and Graduates

MUSC 120, 121. HISTORY OF MUSIC. (3, 3)

Prerequisites, MUSC 001 or 020 and junior standing. A study of musical styles from their origins in western Europe to their present-day manifestations. The interaction of music and other cultural activities. MUSC 120, the Greek period to Bach; MUSC 121, Bach to the present. (Bernstein)

MUSC 125. HONORS READING COURSE. (2-3)

Prerequisites, junior standing and consent of Honors Committee. Selected readings in the history, literature, and theory of music. The course may be repeated for credit at the discretion of the Committee. (Staff)

- MUSC 130, 131. MUSIC LITERATURE SURVEY FOR THE NON-MAJOR. (3, 3)**
 Either semester may be taken separately. Prerequisite, MUSC 020 or the equivalent. Open to all students except music and music-education majors. Selected compositions are studied from the standpoint of the informed listener. MUSC 130, choral music, opera, and art song; MUSC 131, orchestral, chamber, and keyboard music.
 (Pennington, Gordon)
- MUSC 141. MUSICAL FORM. (3)**
 Prerequisite, MUSC 070, 071. A study of the organizing principles of musical composition, their interaction in musical forms, and their functions in different styles.
 (Staff)
- MUSC 143, 144. COMPOSITION. (2, 2)**
 Prerequisite, MUSC 070, 071. Principles of musical composition, and their application to the smaller forms. Original writing in nineteenth and twentieth century musical idioms for various media.
 (Trimble)
- MUSC 145, 146. COUNTERPOINT. (2, 2)**
 Prerequisite, MUSC 070, 071. A course in eighteenth-century contrapuntal techniques. Study of devices of imitation in the invention and the choral prelude. Original writing in the smaller contrapuntal forms.
 (Diemer)
- MUSC 147, 148. ORCHESTRATION. (2, 2)**
 Prerequisite, MUSC 070, 071. A study of the ranges, musical functions, and technical characteristics of the instruments, and their color possibilities in various combinations. Practical experience in orchestrating for small and large ensembles.
 (Trimble)
- MUSC 149. MODAL COUNTERPOINT. (2)**
 Prerequisite, MUSC 071 or the equivalent. An introduction to the contrapuntal techniques of the sixteenth century: the structure of the modes, composition of modal melodies, and contrapuntal writing for two, three, and four voices.
 (Diemer)
- MUSC 150. HARMONIC AND CONTRAPUNTAL PRACTICES OF THE TWENTIETH CENTURY. (2)**
 Prerequisites, MUSC 071 and 145 or the equivalents. A theoretical study of twentieth-century materials: scales, modes, intervals, chord structures, poly-harmony, and serial and twelve-tone organization.
 (Diemer)
- MUSC 160, 161. CONDUCTING. (2, 2)**
 MUSC 160 or equivalent is prerequisite to MUSC 161. A laboratory course in conducting vocal and instrumental groups. Baton technique, score reading, rehearsal techniques, tone production, style, and interpretation. Music of all periods will be introduced.
 (Traver, Ostling)
- MUSC 163. CONTEMPORARY MUSIC. (3)**
 Prerequisites, MUSC 120 and 121 or the equivalent. A study of music written in contemporary idioms since Debussy. Changes in form and performing media in the twentieth century. Electronic music and other experimental types.
 (Diemer)
- MUSC 164. SOLO VOCAL LITERATURE. (3)**
 Prerequisite, MUSC 120, 121, or the equivalent. The study of solo vocal literature from the Baroque cantata to the art song of the present. The *Lied*, *melodie*, vocal chamber music, and the orchestral song are examined.
 (Pennington)
- MUSC 165. KEYBOARD MUSIC. (3)**
 Prerequisite, MUSC 120, 121, or the equivalent. The history and literature of

harpsichord, organ, and piano music from the Baroque period to the present. Suites, sonatas, and smaller forms are studied with emphasis on changes of style and idiom. (Bernstein)

MUSC 166. SURVEY OF THE OPERA. (3)

Prerequisite, MUSC 120, 121, or the equivalent. A study of the music, librettos, and composers of the standard operas. (Bernstein)

MUSC 167. SYMPHONIC MUSIC. (3)

Prerequisite, MUSC 120, 121, or the equivalent. The study of orchestral music from the Baroque period to the present. The concerto, symphony, overture, and other forms are examined. (McCorkle)

MUSC 168. CHAMBER MUSIC. (3)

Prerequisite, MUSC 120, 121, or the equivalent. The history and literature of chamber music from the early Baroque period to the present. Music for trio sonata, string quartet and quintet, and combinations of piano and string instruments is studied. (Ulrich)

MUSC 169. CHORAL MUSIC. (3)

Prerequisite, MUSC 120, 121, or the equivalent. The history and literature of choral music from the Renaissance to the present, with discussion of related topics such as Gregorian chant, vocal chamber music, etc. (McCorkle)

MUSC 175. CANON AND FUGUE. (3)

Prerequisite, MUSC 146 or the equivalent. Composition and analysis of the canon and fugue in the styles of the eighteenth, nineteenth, and twentieth centuries. (Trimble)

MUSC 180. ACOUSTICS FOR MUSICIANS. (3)

Prerequisites, MUSC 071 or the equivalent, and senior or graduate standing in music. The basic physics of music, acoustics of musical instruments and music theory, physiological acoustics, and musico-architectural acoustics. (Staff)

MUSC 182. CHAMBER MUSIC REPERTOIRE. (3)

Four hours per week. Prerequisite, graduate standing as a major in performance. A systematic study, through performance, of diversified chamber music for the standard media. Repertoire covered will be determined by the personnel available in the class. May be repeated for credit. (Staff)

MUSC 185. MUSIC PEDAGOGY. (3)

Conference course. Pre- or co-requisite, MUSC 152 or a more advanced course in applied music. A study of major pedagogical treatises in music, and an evaluation of pedagogical techniques, materials, and procedures. (Staff)

For Graduates

MUSC 200. ADVANCED STUDIES IN THE HISTORY OF MUSIC. (3)

Prerequisites, MUSC 120, 121, and consent of instructor. A critical study of one style period (Renaissance, Baroque, etc.) will be undertaken. The course may be repeated for credit, since a different period will be chosen each time it is offered. (Bernstein, McCorkle)

MUSC 201. SEMINAR IN MUSIC. (3)

Prerequisites, MUSC 120, 121, and consent of instructor. The work of one major composer (Bach, Beethoven, etc.) will be studied, with emphasis on musicological method. The course may be repeated for credit, since a different composer will be chosen each time it is offered. (Bernstein, McCorkle)

MUSC 202. PRO-SEMINAR IN THE HISTORY AND LITERATURE OF MUSIC. (3)

Prerequisite, MUSC 121. An introduction to graduate study in the history and

literature of music. Bibliography and methodology of systematic and historical musicology. (Bernstein)

MUSC 203. SEMINAR IN MUSICOLOGY. (3)

Prerequisite, MUSC 121. An intensive course in one of the areas of musicology such as performance practices, history of music theory, history of notation, or ethnomusicology. Since a cycle of subjects will be studied, the course may be repeated for credit. (Bernstein, McCorkle)

MUSC 204. AMERICAN MUSIC. (3)

Prerequisite, MUSC 121. A lecture course in the history of American art music from Colonial times to the present. (McCorkle)

MUSC 206. ADVANCED MODAL COUNTERPOINT. (3)

Prerequisite, MUSC 149 or the equivalent. An intensive course in the composition of music in the style of the late Renaissance. Analytical studies of the music of Palestrina, Lasso, and Byrd. (Trimble)

MUSC 207. THE CONTEMPORARY IDIOM. (3)

Prerequisite, MUSC 144 or the equivalent. Composition and analysis in the twentieth-century styles, with emphasis on techniques of melody, harmony, and counterpoint. (Trimble)

MUSC 208. ADVANCED ORCHESTRATION. (3)

Prerequisite, MUSC 148 or the equivalent. Orchestration projects in the styles of Debussy, Ravel, Stravinsky, Schoenberg, Bartok, and others. (Trimble)

MUSC 209. SEMINAR IN MUSICAL COMPOSITION. (3)

Prerequisite, MUSC 144 or the equivalent. An advanced course in musical composition. (Trimble)

MUSC 210. FACTORS IN MUSICAL LEARNING. (3)

Prerequisite, MUSC 121 and at least one course in psychology. The psychology of intervals, scales, rhythms, and harmony. Musical hearing and creativity. The psychology of musical ability. The theory of functional music. Musical tests and measurements. (Staff)

MUSC 211. SPECIAL STUDIES IN MUSIC. (3)

Prerequisite, MUSC 121 or the equivalent. Conference course in problems in music history, literature, and theory. May be repeated for credit. (Staff)

MUSC 212, 213. INTERPRETATION, PERFORMANCE, AND ANALYSIS OF THE STANDARD REPERTOIRE. (2-4, 2-4)

Prerequisite, consent of graduate faculty in the Department. A seminar in analysis and interpretation for the graduate performer, with advanced instruction at the instrument of the works studied. In MUSC 213 a seminar paper and a full length recital are required. Special fee of \$40.00 per semester for each course. (Staff)

MUSC 215. AESTHETICS OF MUSIC. (3)

Prerequisites, MUSC 121 or the equivalent and at least one course in aesthetics. A consideration of the principal theories of aesthetics as they relate to music. A study of writing in the field from Pythagoras to Langer. (Staff)

MUSC 218. TEACHING THE THEORY, HISTORY, AND LITERATURE OF MUSIC. (3)

Prerequisite, consent of instructor. A course in teaching methodology, with emphasis on instruction at the college level. (Ulrich)

MUSC 260. ADVANCED CONDUCTING. (3)

Prerequisite, MUSC 161 or the equivalent. A concentrated study of the con-

ducting techniques involved in the repertoire of all historical periods.

(Traver)

MUSC 270, 271. ADVANCED ANALYTICAL TECHNIQUES. (3, 3)

Prerequisites, advanced standing in music and permission of the instructor. A seminar in which composer and theorist will develop analytical facility in advanced nineteenth- and twentieth-century music and an inclusive technique of analysis in music from the Renaissance to the present.

(Trimble)

MUSC 300, 301. DOCTORAL SEMINAR IN MUSIC LITERATURE. (3, 3)

Prerequisite, at least 12 graduate hours in music history and literature. An analytical survey of the literature of music: Section 1, keyboard music; Section 2, vocal music; Section 3, string-instrument music; Section 4, wind-instrument music. Required of all candidates for the D.M.A. degree in Literature-Performance.

(Heim and Staff)

MUSC 305. DOCTORAL SEMINAR IN MUSIC. (3)

Prerequisites, at least 12 graduate hours in music history and a familiarity with musicological methods and bibliography. A study of topics in music history and theory based on original research in the subject areas. Required of all candidates for the Ph.D. degree. May be repeated for credit.

(McCorkle and Staff)

MUSC 306. ADVANCED COMPOSITION. (3)

Prerequisite, MUSC 209 or the equivalent, and permission of the instructor. Conference course in composition in the larger forms.

(Trimble)

MUSC 312, 313, 314. INTERPRETATION, PERFORMANCE, AND PEDAGOGY. (4, 4, 4)

Prerequisite, consent of the Graduate Music faculty. A seminar in pedagogy and the pedagogical literature for the doctoral performer, with advanced instruction at the instrument, covering appropriate compositions. Required of all candidates for the D.M.A. degree in Literature-Performance. In MUSC 313 a lecture recital will be required, and in MUSC 314 a seminar paper and full-length recital. Special fee of \$40.00 for each course.

(Staff)

MUSC 399. THESIS RESEARCH. (3-6)

Research in Theory or History and Literature of Music, and Musical Composition. May be repeated for credit.

(Staff)

APPLIED MUSIC

A new student or one taking applied music for the first time at this University should register for MUSC 999. He will receive the proper classification at the end of his first semester in the Department. Special fee of \$40.00 per semester for each applied-music course.

Section designation: Each student taking an applied-music course should, in addition to registering for the proper course number, indicate the instrument chosen by adding a section as follows:

Sec. A, Piano
Sec. B, Voice
Sec. C, Violin
Sec. D, Viola
Sec. E, Cello
Sec. F, Bass
Sec. G, Flute
Sec. H, Oboe
Sec. I, Clarinet

Sec. J, Bassoon
Sec. K, Horn
Sec. L, Trumpet
Sec. M, Trombone
Sec. N, Tuba
Sec. O, Euphonium
Sec. P, Organ
Sec. Q, Percussion
Sec. R, Saxophone

MUSC 012, 013. APPLIED MUSIC. (2-4 HOURS EACH COURSE)

Freshman course. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for piano majors in the B.Mus. curriculum only. Special fee of \$40.00 per semester. (Staff)

MUSC 052, 053. APPLIED MUSIC. (2-4 HOURS EACH COURSE)

Sophomore course. Prerequisite, MUSC 013 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental majors in the B.Mus. curriculum only. Special fee of \$40.00 per semester. (Staff)

MUSC 112, 113. APPLIED MUSIC. (2-4 HOURS EACH COURSE)

Junior course. Prerequisite, MUSC 053 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental majors in the B.Mus. curriculum only. Special fee of \$40.00 per semester. (Staff)

MUSC 152, 153. APPLIED MUSIC. (2-4 HOURS EACH COURSE)

Senior course. Prerequisite, MUSC 113 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental or vocal majors in the B.Mus. curriculum only. Special fee of \$40.00 per semester. (Staff)

For applied music on the graduate level, see MUSC 212, 213, and MUSC 312, 313, and 314, above.

PHILOSOPHY

Professor and Chairman: SCHLARETZKI.

Professor: PASCH.

Visiting Professors: MUNDLE,* WHITE,** TRANOY.***

Associate Professors: BROWN, CELARIER.

Assistant Professors: KRESS, ODELL, VARNEDOE, WINSLADE.

Visiting Assistant Professor: LESHER.

Lecturers: GOLDSTONE, GOODWIN, ROELOFS.

Lecturer (part-time): COMBER.

Instructors (part-time): HOUSTON, LINDSAY.

The Department of Philosophy presents visiting speakers from this country and abroad in its Colloquium series, scheduled throughout the academic year. In addition, members of the Department and advanced graduate students lecture on topics of current significance in the Graduate Workshop and in the undergraduate Philosophy Club.

The undergraduate course offerings of the Department of Philosophy are, as a group, intended both to satisfy the needs of persons wishing to make philosophy their major field and to provide ample opportunity for other students to explore the subject. In general, the study of philosophy can contribute to the

*Spring semester, 1967-68.

**Fall semester, 1967-68.

***Spring semester, 1968-69.

education of the university student by giving him experience in critical and imaginative reflection on fundamental concepts and principles, by acquainting him with some of the philosophical beliefs which have influenced and are influencing his own culture, and by familiarizing him with some classic philosophical writings through careful reading and discussion of them. Courses designed with these objectives primarily in mind are PHIL 001 (Introduction to Philosophy), PHIL 041 (Elementary Logic and Semantics), PHIL 045 (Ethics), PHIL 053 (Philosophy of Religion), and the historical courses 101 through 105.

For students interested particularly in philosophical problems arising within their own special disciplines, a number of appropriate courses are available: PHIL 052 (Philosophy in Literature), PHIL 056 (Philosophy of Science), PHIL 130 (The Conflict of Ideals in Western Civilization), PHIL 141 (Philosophy of Language), PHIL 147 (Philosophy of Art), PHIL 152 (Philosophy of History), PHIL 154 (Political and Social Philosophy), PHIL 156 (Topics in the Philosophy of Science), and PHIL 176 (Induction and Probability).

The Departmental requirements for a major in philosophy are as follows: (1) a total of at least 30 hours in Philosophy, not including PHIL 001; (2) PHIL 045, 055, 101, 102, 104, and at least two courses numbered 150 or above; (3) a grade of "C" or better in each course counted toward the fulfillment of the major.

For students of exceptional ability and interest in philosophy, the Department offers an Honors Program. Information regarding this special curriculum may be obtained from the departmental advisers.

PHIL 001. INTRODUCTION TO PHILOSOPHY. (3)

An introduction to some of the main problems of philosophy, and to some of the main ways of dealing with these problems.

PHIL 041. ELEMENTARY LOGIC AND SEMANTICS. (3)

An introductory study of logic and language, intended to help the student increase his ability to employ language with understanding and to reason correctly. Topics treated include the use and abuses of language, techniques for making sound inferences, and the logic of science. (Staff)

PHIL 045. ETHICS. (3)

An introduction to moral philosophy, including a critical examination of some important classic and contemporary systems of ethics, such as those of Aristotle, Kant, Mill, and Dewey. (Staff)

PHIL 052. PHILOSOPHY IN LITERATURE. (3)

Reading and philosophical criticism of novels and dramas containing ideas significant for ethics, social policy, and religion. (Staff)

PHIL 053. PHILOSOPHY OF RELIGION. (3)

This course seeks to provide the student with the means by which he may approach intelligently the main problems of religious thought: the nature of religious experience, the forms of religious expression, the conflicting claims of religion and science, and the place of religion in the community and in the life of the individual. (Brown, Roelofs)

PHIL 055. SYMBOLIC LOGIC I. (3)

An introduction to the formal analysis of deductive reasoning through formalization of arguments, truth table and natural deduction techniques for propositional logic and quantification theory, including identity and definite descriptions. (Staff)

PHIL 056. PHILOSOPHY OF SCIENCE. (3)

An introductory study of the aims, procedures, and results of scientific inquiry. Topics discussed include the formulation and testing of hypotheses, induction and probability, scientific laws, theories and explanation, concept formation, and relationships among the special sciences. (Staff)

PHIL 101. ANCIENT PHILOSOPHY. (3)

Prerequisites, PHIL 001 and either one additional course in philosophy or senior standing. A history of Greek thought from its beginnings to the time of Justinian. The chief figures discussed: The Presocratic philosophers, Socrates, Plato, Aristotle, Epicurus, the Stoic philosophers, and Plotinus. (Celarier)

PHIL 102. MODERN PHILOSOPHY. (3)

Prerequisites, PHIL 001 and either one additional course in philosophy or senior standing. A history of philosophical thought in the West during the 16th, 17th, and 18th centuries. The chief figures discussed: Bacon, Galileo, Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. (Winslade)

PHIL 103. NINETEENTH-CENTURY PHILOSOPHY. (3)

Prerequisites, PHIL 001 and either one additional course in philosophy or senior standing. A survey of philosophy in the nineteenth century through a consideration of such writers as Hegel, Schopenhauer, Nietzsche, Spencer, Marx, Comte, Mill, Mach, and Bradley. (Staff)

PHIL 104. TWENTIETH-CENTURY PHILOSOPHY. (3)

Prerequisites, PHIL 001 and either one additional course in philosophy or senior standing. A survey of philosophy in the twentieth century through a consideration of representative figures in England, Europe, and America. Among the theories to be studied are logical atomism (Russell, Wittgenstein), positivism (Carnap, Ayer), existentialism and phenomenology (Sartre, Husserl), naturalism and realism (Dewey, Santayana). (Brown)

PHIL 105. PHILOSOPHY IN AMERICA. (3)

Prerequisite, PHIL 001. A survey of philosophical thought in America from the eighteenth century to the present. Special attention is given to Edwards, Jefferson, Emerson, Royce, Pierce, James, and Dewey. (Varndoe)

PHIL 120. ORIENTAL PHILOSOPHY. (3)

Prerequisite, one course in philosophy. Not offered on College Park campus. An examination of the major philosophical systems of the East, attempting to discover the relations between these and important ideas of Western thought.

PHIL 130. THE CONFLICT OF IDEALS IN WESTERN CIVILIZATION. (3)

A critical and constructive philosophical examination of the assumptions, goals, and methods of contemporary democracy, fascism, socialism, and communism, with special attention to the ideological conflict between the U.S.A. and the U.S.S.R. (Staff)

PHIL 141. PHILOSOPHY OF LANGUAGE. (3)

Prerequisite, PHIL 041 or 055. An inquiry into the nature and function of language and other forms of symbolism. (Kress)

PHIL 147. PHILOSOPHY OF ART. (3)

An examination of the fundamental concepts in art and in esthetic experience generally. Readings from the works of artists, estheticians, critics and philosophers. (Brown)

PHIL 151. ETHICAL THEORY. (3)

Prerequisite, PHIL 045. Contemporary problems having to do with the meaning of the principal concepts of ethics and with the nature of moral reasoning. (Roelofs, Schlaretzki)

PHIL 152. PHILOSOPHY OF HISTORY. (3)

An examination of the nature of historical knowledge and historical explanation, and of theories of the meaning of world history. (Staff)

PHIL 154. POLITICAL AND SOCIAL PHILOSOPHY. (3)

A systematic treatment of the main philosophical issues encountered in the analysis and evaluation of social (especially political) institutions. (Goldstone, Schlaretzki)

PHIL 155. SYMBOLIC LOGIC II. (3)

Prerequisite, PHIL 055 or consent of instructor. Axiomatic development of the propositional calculus and the first-order functional calculus, including the deduction theorem, independence of axioms, consistency and completeness. (Staff)

PHIL 156. TOPICS IN THE PHILOSOPHY OF SCIENCE. (3)

Prerequisite, PHIL 056 or consent of instructor. Detailed examination of some basic issues in the methodology and conceptual structure of scientific inquiry. To be investigated are such topics as confirmation theory, structure and function of scientific theories, scientific explanation, concept formation, and theoretical reduction. (Staff)

PHIL 157. THEORY OF MEANING. (3)

Prerequisites, PHIL 041 or 055, and 102. A study of theories about the meaning of linguistic expressions, including the verification theory and the theory of meaning as use. Among topics to be considered are naming, referring, synonymy, intension and extension, and ontological commitment. Such writers as Mill, Frege, Russell, Lewis, Carnap, Wittgenstein, Austin, and Quine will be discussed. (Kress, Odell)

PHIL 168. TOPICS IN THE HISTORY OF PHILOSOPHY. (3)

Prerequisite, PHIL 101 and 102, or consent of instructor. May be repeated for credit when the topics dealt with are different. (Staff)

PHIL 169. TOPICS IN CONTEMPORARY PHILOSOPHY. (3)

Prerequisite, PHIL 102. An intensive examination of contemporary problems and issues. Source material will be selected from recent books and articles. May be repeated for credit when the topics dealt with are different. (Staff)

PHIL 170. METAPHYSICS. (3)

First semester. Prerequisites, PHIL 101 and 102. PHIL 055 recommended. A study of some central metaphysical concepts (such as substance, relation, causality, and time) and of the nature of metaphysical thinking. (Pasch, Winslade)

PHIL 171. THEORY OF KNOWLEDGE. (3)

Second semester. Prerequisites, PHIL 101 and 102. PHIL 055 recommended. The origin, nature, and validity of knowledge will be considered in terms of some philosophic problems about perceiving and thinking, knowledge and belief, thought and language, truth and confirmation. (Brown, Odell, Pasch)

PHIL 175. TOPICS IN SYMBOLIC LOGIC. (3)

Prerequisite, PHIL 155. May be repeated for credit when the topics dealt with are different. (Staff)

PHIL 176. INDUCTION AND PROBABILITY. (3)

Prerequisite, consent of instructor. A study of inferential forms, with emphasis on the logical structure underlying such inductive procedures as estimating and hypothesis-testing. Decision-theoretic rules relating to induction will be considered, as well as classic theories of probability and induction. (Staff)

PHIL 180. THE PHILOSOPHY OF PLATO. (3)

Prerequisites, PHIL 101 and 102. A critical study of selected dialogues.

(Celarier)

PHIL 181. THE PHILOSOPHY OF ARISTOTLE. (3)

Prerequisites, PHIL 101 and 102. A critical study of selected portions of Aristotle's writings.

(Celarier)

PHIL 182. MEDIEVAL PHILOSOPHY. (3)

Prerequisite, PHIL 101 or 102. A history of philosophic thought in the West from the close of the Classical period to the Renaissance. Based on readings of the Stoics, early Christian writers, Neoplatonists, later Christian writers and Schoolmen.

(Celarier)

PHIL 184. THE CONTINENTAL RATIONALISTS. (3)

Prerequisites, PHIL 101 and 102. A critical study of the systems of some of the major 17th and 18th century rationalists, with special reference to Descartes, Spinoza, and Leibniz.

(Staff)

PHIL 185. THE BRITISH EMPIRICISTS. (3)

Prerequisites, PHIL 101 and 102. A critical study of selected writings of Locke, Berkeley, and Hume.

(Varnedoe)

PHIL 186. THE PHILOSOPHY OF KANT. (3)

Prerequisites, PHIL 101 and 102. A critical study of selected portions of Kant's writings.

(Roelofs)

PHIL 190. HONORS SEMINAR. (3)

Each semester. Open to honors students in philosophy and, by permission of the instructor, to honors students in other departments. Research in selected topics, with group discussion. May be repeated for credit when the topics dealt with are different.

(Staff)

PHIL 191, 192, 193, 194. TOPICAL INVESTIGATIONS. (1-3)

(Staff)

PHIL 255. SEMINAR IN THE HISTORY OF PHILOSOPHY. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 256. SEMINAR IN THE PROBLEMS OF PHILOSOPHY. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 260. SEMINAR IN ETHICS. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 261. SEMINAR IN ESTHETICS. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 270. SEMINAR IN METAPHYSICS. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 271. SEMINAR IN THEORY OF KNOWLEDGE. (3)

Prerequisite, consent of instructor.

(Staff)

PHIL 292. SELECTED PROBLEMS IN PHILOSOPHY. (1-3)

Each semester. Prerequisite, consent of instructor.

(Staff)

PHIL 399. RESEARCH IN PHILOSOPHY. (1-12)

Each semester.

(Staff)

PHYSICS AND ASTRONOMY

Professor and Chairman: LASTER.

Associate Professor and Associate Chairman: RODBERG.

Professors: BANERJEE, DAY, ESCOBAR (P.T.), FERRELL, FOWLER (P.T.), FRIEDMAN (P.T.), GLOVER, GREENBERG, GRIEM, HAYWARD (P.T.), HOLMGREN, HORNYAK, KERR, KOLB (P.T.), KRALL, LEVINSON, MACDONALD, F. McDONALD (P.T.), MARION, MISNER, MUSEN (P.T.), MYERS, ONEDA, RADO (P.T.), SLAWSKY (P.T.), SNOW, SUCHER, TRIVELPIECE, WALL, WEBER, WESTERHOUT AND YODH.

Research Professors: BENESCH,² FALLER,¹ NORTHRUP¹ (P.T.), OPIK, TIDMAN¹ VANDERSLICE,² WILKERSON,¹ AND ZWANZIG.^{1,2}

Associate Professors: ALLEY, BENNETT (P.T.), BHAGAT, BRANDT (P.T.), J. R. DIXON (P.T.), EARL, ERICKSON, FALK, GLASSER, GLICK, GUERNSEY,¹ HINTZ, KACSER, MATTHEWS, ONEDA, PATI, PRANGE, PUGH, REISER,³ E. SMITH, STEINBERG, WENTZEL, ZIPOY, AND G. ZORN.

Research Associate Professors: KRISHER,² LASHINSKY,¹ AND D. L. MATTHEWS.¹

Assistant Professors: A'HEARN, ANDERSON, BARDASIS, BEAGLEHOLE, BEALL, BELL, BERG, BETTINGER, BRUCKNER, CARMELI, CHANG, CURRIE, DESILVA, DI LAVORE,⁴ DORFMAN,¹ DRAGT, FIVEL, GLOECKLER, GREENE, GREIG, GRIFFIN, GUTSCHE (P.T.), KEHOE, H. G. KIM,³ Y. S. KIM, KOCH, KORENMAN, KUNZE, LAPOINTE, LEIBOWITZ, LENCHEK, PECHACEK, POULTNEY, ROOS, ROUSH, RISK, STEPHENSON, WOO, WOODS, YOUNG, ZAPOLSKY AND B. S. ZORN.

Research Assistant Professors: CHARATIS, DE ROCCO,² GINTER,² GOLDMAN,¹ KOOPMAN,¹ MUNN,² SPAIN,¹ AND VERBEKE.²

Research Associates: R. BRANDT, COLLERAINE, CONNORS, DREW, DUCHS, EDWARDS, GOLDBERG, GOLDENBAUM, GRIFFITH, HEMINGWAY, HINDS, HUDSON, KEPPLER, KOCHLER, JOHNSTONE, MEAD, MEYER, MITTER, NAUGLE, NINIO, ORZALESI, PAYNE, RESNIKOFF, RICHARD, SHARMA, SINCLAIR, S. SMITH, SWANK, WAYLAND, WEYMANN AND VANCURA.

Visiting Lecturers: FICHTEL AND ARMSTRONG.

The physics curriculum for the B.S. degree is designed for students who desire education in the fundamentals of physics in preparation for graduate work or teaching, or for positions in governmental and industrial laboratories. Students who enter the University intending to major in physics are urged to take, during the first two years, the introductory courses PHYS 015, 016, 017, 018, and 060, 061. For students who enter the physics major in their junior year, however, PHYS 020, 021, 060, 104, 105 and 106 may be substituted for the PHYS 015-061 sequence. All students should accompany these basic courses with MATH 019, 020, 021, and 022 (4, 4, 4, 4), (or the corresponding honors courses) and one advanced mathematics course. Physics majors are

¹ Member of the Institute for Fluid Dynamics and Applied Mathematics

² Member of the Institute of Molecular Physics

³ Joint appointment with Electrical Engineering

⁴ Joint appointment with Education

encouraged to try to enroll in the accelerated honors sections of all of these courses when they are qualified.

After completion of the courses mentioned above, the Physics majors will be required to take the following courses: PHYS 127, 128—Elements of Mathematical Physics (4, 4), PHYS 118—Introduction to Modern Physics (3), and PHYS 119—Modern Physics (3); and at least two semesters of advanced laboratory courses (e.g., PHYS 100, 109, 110, 140, 141, and 190). Supporting courses must include at least one additional mathematics course approved by the physics adviser (which is usually MATH 110 or MATH 162). At least 38 credits in physics normally are required.

The departmental requirement is at least a "C" in each semester of the first year of the introductory course. Students who wish to be recommended for graduate work must maintain a "B" average and should also include as many as possible of the following courses: PHYS 120—Nuclear Physics (4), PHYS 122—Properties of Matter (4), PHYS 140, 141—Atomic and Nuclear Physics Laboratory (3, 3), PHYS 144, 145—Methods of Theoretical Physics (4, 4), and MATH 110—Advanced Calculus (3).

Recommended course programs are available from the Department.

HONORS IN PHYSICS

The Honors Program offers to students of exceptional ability and interest in physics an educational program with a number of special opportunities for learning. Honors sections are offered in several courses, and there are many opportunities for part-time research participation which may develop into full-time summer projects. An honors seminar is offered for advanced students; credit may be given for independent work or study; and certain graduate courses are open for credit toward the bachelor's degree.

Students for the Honors Program are accepted by the Department's Honors Committee on the basis of recommendations from their advisers and other faculty members. A final written and oral comprehensive examination in the senior year concludes the program which may lead to graduation "with Honors (or High Honors) in Physics."

CHEMICAL PHYSICS

See Molecular Physics, page 115.

PHYS 001. ELEMENTS OF PHYSICS: MECHANICS, HEAT, AND SOUND. (3)

Three lectures a week. Prerequisite, successful passing of the qualifying examination in elementary mathematics. The first half of a survey course in general physics. *This course is for the general student and does not satisfy the requirements of the professional schools.* (Alley)

PHYS 002. ELEMENTS OF PHYSICS: MAGNETISM, ELECTRICITY, AND OPTICS. (3)

Three lectures a week. Prerequisite, PHYS 001. The second half of a survey course in general physics. *This course is for the general student and does not satisfy the requirements of the professional schools.* (Marion, Alley)

PHYS 003. INTRODUCTION TO PHYSICS. (4)

Three lectures and one two-hour laboratory per week. Prerequisite, qualification to enter MATH 010. Intended for students majoring in neither the physical nor biological sciences. A study of the development of some of the basic ideas of physical science. (Stephenson)

PHYS 010, 011. FUNDAMENTALS OF PHYSICS. (4, 4)

Three lectures, one recitation, and one two-hour laboratory period a week. Prerequisite, entrance credit in trigonometry or MATH 011 or concurrent enrollment in MATH 018. A course in general physics treating the fields of mechanics, heat, sound, electricity, magnetism, optics, and modern physics. *This course satisfies the minimum requirements of medical and dental schools.*

(Snow, DiLamore, Pechacek, Young)

PHYS 015, 016. INTRODUCTORY PHYSICS: MECHANICS, FLUIDS, HEAT, AND SOUND. (4, 4)

Three lectures and two demonstration periods a week. Prerequisites, a high school physics course and concurrent enrollment in MATH 018, 019, or consent of instructor. The first half of a broad, detailed introduction to physics, intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences.

(Wall, Trivelpiece, Beaglehole)

PHYS 017. INTRODUCTORY PHYSICS: ELECTRICITY AND MAGNETISM. (4)

Three lectures and two demonstration periods a week. Prerequisites, PHYS 015, 016; pre- or co-requisites, PHYS 060 and MATH 020. The third quarter of a broad, detailed introduction to physics, intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences.

(Hintz, Kehoe)

PHYS 018. INTRODUCTORY PHYSICS: OPTICS AND MODERN PHYSICS. (4)

Second semester. Three lectures and two demonstration periods a week. Prerequisites, PHYS 017 and previous or concurrent enrollment in PHYS 060 and MATH 021, or consent of instructor. The last quarter of a broad, detailed introduction to physics, intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences.

(Roush)

PHYS 020. GENERAL PHYSICS: MECHANICS, HEAT, AND SOUND. (5)

Three lectures, two recitations and one two-hour laboratory period a week. MATH 020 to be taken concurrently. The first half of a course in general physics. *Required of all students in the engineering curricula.*

(Day, Steinberg, MacDonald, Griffin and Staff)

PHYS 021. GENERAL PHYSICS: ELECTRICITY, MAGNETISM, AND OPTICS. (5)

Three lectures, two recitations, and one two-hour laboratory period a week. Prerequisite, PHYS 020. MATH 021 to be taken concurrently. The second half of a course in general physics. *Required of all students in the engineering curricula.*

(Day, Steinberg, MacDonald, Griffin and Staff)

PHYS 030. GENERAL PHYSICS: MECHANICS AND PARTICLE DYNAMICS. (3)

Three lectures and one recitation per week. MATH 020 to be taken concurrently. Laws of motion, force, and energy; principles of mechanics; collisions; rotation; and gravitation.

PHYS 031. GENERAL PHYSICS: HEAT, WAVES AND RELATIVITY. (4)

Three lectures, one recitation and one three-hour laboratory period per week. Prerequisite, PHYS 030 or PHYS 020. Statistical physics; kinetic theory; wave motion; interference and refraction; special theory of relativity.

PHYS 032. GENERAL PHYSICS: ELECTRICITY AND MAGNETISM. (4)

Three lectures, one recitation and one three-hour laboratory period per week. Prerequisite, PHYS 031. May be taken in lieu of repetition of PHYS 021. Electrostatics; electrodynamics; Maxwell's equation; quantum physics.

PHYS 050, 051. INTERMEDIATE PHYSICS. (2, 2)

First and second semesters. Two lectures a week. Prerequisite, PHYS 011 or 021. (Staff)

PHYS 052. HEAT. (3)

First semester. Three lectures a week. Prerequisite, PHYS 011 or 021. MATH 020 is to be taken concurrently. (Staff)

PHYS 054. SOUND. (3)

(Will be given only with sufficient demand.) Three lectures a week. Prerequisite, PHYS 011 or 021. MATH 021 is to be taken concurrently. (Myers)

PHYS 060, 061. INTERMEDIATE PHYSICS EXPERIMENTS. (2, 2)

Four hours of laboratory work per week. Prerequisite, PHYS 011 or 021 or concurrent enrollment in PHYS 017 or PHYS 018. Selected experiments. (Poultney, Gloeckler)

PHYS 100. ADVANCED EXPERIMENTS. (2 credits per semester)

Four hours of laboratory work per week. Prerequisite, four credits of PHYS 060 or consent of instructor. Selected fundamental experiments in electricity and magnetism, elementary electronics, and optics. (Greig)

PHYS 102. OPTICS. (3)

Second semester. Three lectures a week. Prerequisites, PHYS 011 or 021, and MATH 021. It is suggested, but not required, that PHYS 060 or PHYS 100 be taken concurrently with this course. Geometrical optics, optical instruments, wave motion, interference and diffraction, and other phenomena in physical optics. (Staff)

PHYS 103. APPLIED OPTICS. (3)

(Will be given only with sufficient demand.) Three lectures a week. Prerequisite, PHYS 102. A detailed study of physical optics and its applications. (Alley)

PHYS 104, 105. ELECTRICITY AND MAGNETISM. (3, 3)

Three lectures a week. Prerequisites, PHYS 011 or 021; MATH 021. Electrostatics, direct current and alternating current circuitry, electromagnetic effects of steady currents, electromagnetic induction, radiation, development of Maxwell's equations, Poynting vector, wave equations, and electronics. (Staff)

PHYS 106, 107. THEORETICAL MECHANICS. (3, 3)

Three lectures a week. Prerequisite, PHYS 051 or consent of instructor. A detailed study of Newtonian mechanics. Dynamics, the motion of rigid bodies, oscillation problems, etc., are studied. Lagrange's equation of the first kind and the Hamilton-Jacobi equation are introduced. (LaPointe)

PHYS 109. ELECTRONIC CIRCUITS. (4)

Second semester. Three hours of lecture and two of laboratory per week. Prerequisite, PHYS 100 and concurrent enrollment in PHYS 105 or PHYS 128. Theory of semi-conductor and vacuum tube circuits. Application in experimental physics. (Bettinger)

PHYS 110. SPECIAL LABORATORY PROJECTS IN PHYSICS. (1, 2, or 3)

Two hours laboratory work a week for each credit hour. One to three credits may be taken concurrently each semester. (Will be given only with sufficient demand.) Prerequisite, PHYS 100 and consent of adviser. Selected advanced experiments. (Glover, Pugh)

PHYS 111. PHYSICS SHOP TECHNIQUES. (1)

First semester. One three-hour laboratory per week. Prerequisite, PHYS 100

or consent of instructor. Machine tools, design and construction of laboratory equipment. (Horn)

PHYS 114, 115. INTRODUCTION TO BIOPHYSICS. (2, 2)

(Will be given only with sufficient demand.) Two lectures a week. Prerequisites, intermediate physics and MATH 021. A study of the physical principles involved in biological processes, with particular emphasis on current research in biophysics. (DeRocco)

PHYS 116, 117. INTRODUCTION TO FLUID DYNAMICS. (3, 3)

Three lectures a week. Prerequisites, PHYS 106 and MATH 021. Kinematics of fluid flow, properties of incompressible fluids, complex variable methods of analysis, wave motions. (Koopman)

PHYS 118. INTRODUCTION TO MODERN PHYSICS. (3)

Three lectures a week. Prerequisites, general physics and integral calculus, with some knowledge of differential equations and a degree of maturity as evidenced by having taken one or more of the courses PHYS 050 through PHYS 110. Introductory discussion of special relativity, origin of quantum theory, Bohr atom, wave mechanics, atomic structure, and optical spectra. (Beall)

PHYS 119. MODERN PHYSICS. (3)

Three lectures a week. Prerequisite, PHYS 118. A survey of nuclear physics, x-rays, radioactivity, wave mechanics, and cosmic radiation. (Staff)

PHYS 120. NUCLEAR PHYSICS. (4)

Four lectures a week. Prerequisite, PHYS 119. An introduction to nuclear physics at the pre-quantum-mechanics level. Properties of nuclei; radioactivity; nuclear systematics; nuclear moments; the shell model, interaction of charged particles and gamma rays with matter; nuclear detector; accelerators; nuclear reactions; beta decay; high energy phenomena. (Holmgren)

PHYS 121. NEUTRON PHYSICS AND FISSION REACTORS. (4)

(Will be given only with sufficient demand.) Four lectures a week. Prerequisite, PHYS 120. Neutron diffusion and reactor physics. (Marion)

PHYS 122. PROPERTIES OF MATTER. (3)

Each semester. Three lectures a week. Prerequisite, PHYS 119 or equivalent. Introduction to solid state physics. Electro-magnetic, thermal, and elastic properties of metals, semiconductors and insulators. (Glover, Anderson)

PHYS 123. INTRODUCTION TO ATMOSPHERIC AND SPACE PHYSICS. (3)

Second semester. Three lectures a week. Prerequisite, PHYS 127 and PHYS 118 or consent of instructor. Motions of charged particles in magnetic fields, aspects of plasma physics related to cosmic rays and radiation belts, atomic phenomena in the atmosphere, thermodynamics and dynamics of the atmosphere. (Bettinger, Lenckek)

PHYS 124. INTRODUCTION TO PLASMA PHYSICS. (3)

Three lecture hours per week. Prerequisite, PHYS 127 and PHYS 118, or consent of instructor. Orbit theory, magnetohydrodynamics, plasma heating and stability, waves and transport processes. (Griem)

PHYS 126. KINETIC THEORY OF GASES. (3)

Three lectures a week. Prerequisites, PHYS 107 and MATH 021. Dynamics of gas particles, Maxwell-Boltzmann distribution, diffusion, Brownian motion, etc. (Vanderslice)

PHYS 127, 128. ELEMENTS OF MATHEMATICAL PHYSICS.

Mechanics, Potential Theory, and Electromagnetic Waves (4,4). First and second semesters. Prerequisite, PHYS 018 and MATH 021, or consent of instructor. A careful study of mathematical approaches used in mechanics, electricity and magnetism, and physical optics. (Dragt, Korenman)

PHYS 129. INTRODUCTION TO ELEMENTARY PARTICLES. (3)

Three lecture hours per week. Prerequisite, PHYS 119, or consent of instructor. Properties of elementary particles, production and detection of particles, relativistic kinematics, invariance principles and conservation laws. (Sucher, Risk)

PHYS 130, 131. BASIC CONCEPTS OF PHYSICS. (2, 2)

Two lectures a week. Prerequisite, junior standing. A primarily descriptive course intended mainly for those students in the liberal arts who have not had any other course in physics. This course neither satisfies the requirements of the professional schools nor serves as a prerequisite or substitute for other physics courses. The main emphasis in the course will be on the concepts of physics and their evolution and their relations to other branches of human endeavor. (Armstrong.)

PHYS 140, 141. ATOMIC AND NUCLEAR PHYSICS LABORATORY. (3, 3)

One lecture and four hours of laboratory a week. Prerequisites, two credits of PHYS 100 and consent of instructor. Classical experiments in atomic physics and more sophisticated experiments in current techniques in nuclear physics. Enrollment is limited to ten students. (Zorn)

PHYS 144, 145. METHODS OF THEORETICAL PHYSICS. (4, 4)

Prerequisite, PHYS 127, 128. A survey of basic ideas in thermodynamics and statistical mechanics. An introduction to electrodynamics, quantum mechanics, and relativity. Primary emphasis will be placed upon the mathematical methods involved in understanding those topics. (Myers)

PHYS 150. SPECIAL PROBLEMS IN PHYSICS.

Prerequisite, major in physics and consent of adviser. Research or special study. Credit according to work done. (Staff)

PHYS 152. INTRODUCTION TO THERMODYNAMICS AND STATISTICAL MECHANICS. (3)

Three lectures a week. Prerequisites, MATH 021, PHYS 018 or 051, or consent of the instructor. Introduction of basic concepts in thermodynamics and statistical mechanics. (Bhagat)

153. MODERN PHYSICS FOR ENGINEERS. (3)

Each semester. Three lectures per week. Prerequisite, PHYS 018 or 021. A survey of atomic and nuclear phenomena and the main trends in modern physics. This course is appropriate for students in engineering and other physical sciences. It should not be taken in addition to PHYS 118.

(B. S. Zorn, Bettinger, Kunze)

PHYS 190. INDEPENDENT STUDIES SEMINAR.

Credit according to work done, each semester. Enrollment is limited to students admitted to the Independent Studies Program in Physics. (Staff)

For Graduates

Of the courses which follow, 200, 201, 204, 205, 209, 212, 213, 234, 235, 242, 243, 244, 252, 253, 254, 255 and 258 are given every year; all others will be given according to demand.

PHYS 200. THEORETICAL DYNAMICS. (3)

Each semester. Three lecture hours per week. Prerequisite, PHYS 127 or

equivalent. Lagrangian and Hamiltonian mechanics, two-body central force problem, rigid body motion, small oscillations, continuous systems.

(Zapolsky, Wilkerson)

PHYS 201. STATISTICAL PHYSICS. (3)

Each semester. Three lecture hours per week. Prerequisite, PHYS 127 or equivalent. Statistical mechanics, thermodynamics, kinetic theory.

(Greene, Zapolsky)

PHYS 202, 203. ADVANCED DYNAMICS. (2, 2)

Two lectures a week. Prerequisite, PHYS 200. A detailed study of advanced classical mechanics.

(Myers)

PHYS 204. METHODS OF MATHEMATICAL PHYSICS. (4)

Each semester. Four lecture hours per week. Prerequisite, advanced calculus; PHYS 127 and 128, or equivalent. Ordinary and partial differential equations of physics, boundary value problems, Fourier series, Green's functions, complex variables and contour integration.

(Woo, Koch)

PHYS 205. ELECTRODYNAMICS. (3)

Each semester. Three lecture hours per week. Prerequisite, PHYS 204 or equivalent. Classical electromagnetic theory: electro and magnetostatics, Maxwell equations, waves and radiation, special relativity.

(Currie, Glasser)

PHYS 206. KINETIC THEORY OF PLASMAS. (3)

Three hours of lecture per week. Prerequisites, PHYS 204, 205. Knowledge of complex variable theory is also desirable. A detailed study of plasma physics.

(Tidman)

PHYS 207. PLASMA PHYSICS. (3)

Prerequisites, PHYS 204, 205. Orbit theory, transport processes, radiation, waves, stability theory.

(Trivelpiece)

PHYS 208. THERMODYNAMICS. (3)

First semester. Three lectures per week. Prerequisite, PHYS 201. The first and second laws of thermodynamics are examined and applied to homogeneous and non-homogeneous systems, calculations of properties of matter, the derivation of equilibrium condition and phase transitions, the theory of irreversible processes.

(Vanderslice)

PHYS 209. GRADUATE LABORATORY. (3)

Each semester. Six hours of laboratory work per week. Design and performance of advanced experiments in modern and classical physics.

(G. Zorn, Bhagat, Myers, Earl)

PHYS 210. STATISTICAL MECHANICS. (3)

Second semester. Three lectures a week. Prerequisites, PHYS 119 and PHYS 201, 205. A study of the determination of microscopic behavior of matter from microscopic models. Microcanonical, canonical, and grand canonical models. Applications to solid state physics and the study of gases.

(Dorfman)

PHYS 212, 213. INTRODUCTION TO QUANTUM MECHANICS. (3, 4)

Each semester. Prerequisite, PHYS 200 or an outstanding undergraduate background in physics. A study of the Schroedinger equation, matrix formulations of quantum mechanics, approximation methods, scattering theory, etc., and applications to solid state, atomic, and nuclear physics.

(Weber, Hornyak, Fivel)

PHYS 214. THEORY OF ATOMIC SPECTRA. (3)

Three lectures a week. Prerequisite, PHYS 213. A study of atomic spectra and

structure—one and two electron spectra, fine and hyperfine structure, line strengths, line width, etc. (Wilkerson)

PHYS 215. THEORY OF MOLECULAR SPECTRA. (3)

Three lectures a week. Prerequisite, PHYS 214. The structure and properties of molecules as revealed by rotational, vibrational, and electronic spectra. (Vanderslice)

PHYS 216, 217. MOLECULAR PHYSICS. (2, 2)

Two lectures per week. Prerequisite, PHYS 213. The fundamentals of the interpretation of the spectra of simple molecules with particular attention to quantitative considerations. Emphasis on topics generally regarded as falling outside the domain of molecular structure, notably the measurement and analysis of molecular spectroscopic line intensities. (Benesch)

PHYS 218, 219. X-RAYS AND CRYSTAL STRUCTURE. (3, 3)

(Will be given only with sufficient demand.) Three lectures per week. Prerequisite, PHYS 201. A detailed study of crystal structure of solids and of x-rays. (Glover)

PHYS 220. APPLICATION OF X-RAY AND ELECTRON DIFFRACTION METHODS. (2)

(Will be given only with sufficient demand.) Two laboratory periods a week. Prerequisite, concurrent enrollment in PHYS 218. The investigation of crystal structure, using x-rays and electron diffraction. (Staff)

PHYS 221. COSMIC RAY PHYSICS. (3)

Three lecture hours per week. Pre- or co-requisite, PHYS 200, or consent of instructor. Interaction of cosmic rays with matter, geomagnetic cutoffs, origin and propagation of cosmic rays, the electron component and its relationship to cosmic radio noise; experimental methods. (Earl)

PHYS 222, 223. BOUNDARY-VALUE PROBLEMS OF THEORETICAL PHYSICS. (2, 2)

Prerequisite, PHYS 205. (Falk)

PHYS 224, 225. SUPERSONIC AERODYNAMICS AND COMPRESSIBLE FLOW. (2, 2)

Two lectures a week. Prerequisite, PHYS 201. (Pai)

PHYS 226, 227. THEORETICAL HYDRODYNAMICS. (3, 3)

Three lectures a week. Prerequisite, PHYS 201. A detailed study of advanced fluid dynamics. (Burgers)

PHYS 228. SYMMETRY PROBLEMS IN PHYSICS. (3)

Three lectures per week. Prerequisite, PHYS 213. A study of general methods of classification of physical systems by their symmetries and invariance properties, especially in quantum field theory applications. (Greenberg)

PHYS 230. SEMINAR.

Seminars on various topics in advanced physics are held each semester, with the contents varied each year. One credit for each seminar each semester. (Staff)

PHYS 231. APPLIED PHYSICS SEMINAR.

(One credit for each semester.) (Staff)

PHYS 232, 233. HYDROMECHANICS SEMINAR. (1, 1)

One meeting a week. (Staff)

PHYS 234, 235. THEORETICAL NUCLEAR PHYSICS. (3, 3)

Three lectures a week. Prerequisite, PHYS 120; co-requisite, PHYS 254. Nuclear properties and reactions, nuclear forces, two, three, and four body problems, nuclear spectroscopy, beta-decay and related topics. (Banerjee)

PHYS 236. THEORY OF RELATIVITY. (3)

Three lectures a week. Prerequisite, PHYS 200. A study of Einstein's special theory of relativity and some consequences, and a brief survey of the foundations of general relativity. (Weber, Misner)

PHYS 238. QUANTUM THEORY—SELECTED TOPICS. (3)

Three lectures a week. Prerequisite, PHYS 213. (Staff)

PHYS 239. ELEMENTARY PARTICLES. (3)

Three lectures a week. Prerequisite, PHYS 254. Survey of elementary particles and their properties, quantum field theory, meson theory, weak interactions, possible extensions of elementary particle theory. (Day, Yodh)

PHYS 240, 241. THEORY OF SOUND AND VIBRATIONS. (3, 3)

Three lectures a week. Prerequisite, PHYS 201. A detailed study of acoustics and the theory of vibrations. (Weber, Zipoy)

PHYS 242, 243. THEORY OF SOLIDS. (3, 3)

First and second semesters. Two lectures a week. Co-requisite, PHYS 254. Properties of metals, lattice vibrations and specific heats; Boltzmann, Fermi-Dirac, and Bose-Einstein statistics, free electron gas theories, band theory of metals. (Prange, Glick)

PHYS 244. SOLID STATE PHYSICS. (3)

Co-requisite, PHYS 213 or equivalent. A variety of topics such as crystal structure, mechanical, thermal, electrical, and magnetic properties of solids, band structure, the semi-surface, and superconductivity will be treated. Although the emphasis will be on the phenomena, the methods of quantum mechanics are freely employed in this description. (Falk, Bardasis)

PHYS 245. SPECIAL TOPICS IN APPLIED PHYSICS.

(2 credits each semester.) Two lectures a week. (Staff)

PHYS 246, 247. SPECIAL TOPICS IN FLUID DYNAMICS. (2, 2)

Prerequisites, advanced graduate standing and consent of the instructor. (Burgers)

PHYS 248, 249. SPECIAL TOPICS IN MODERN PHYSICS. (2-4, 2-4)

Two lectures a week. Prerequisite, consent of instructor. Credit according to work done. (Staff)

PHYS 252, 253. NUCLEAR STRUCTURE PHYSICS. (3, 3)

Three lecture hours per week. Prerequisite, PHYS 120 or equivalent; co-requisite, PHYS 212, 213 or consent of instructor. Nuclear structure and nuclear reactions. Two-body scatterings; nucleon-nucleon forces and the deuteron. Neutron scattering; the optical model. Resonance reactions, phase-shift analysis, positions and properties of energy levels; the shell model. Direct reactions. Electromagnetic transitions. Photoreactions. The design of experiments; the extraction of parameters from experimental data and the comparison with nuclear models. (Pugh)

PHYS 254. ADVANCED QUANTUM MECHANICS. (3)

Prerequisite, PHYS 213. Relativistic wave equations, second quantization in many body problems and relativistic wave equations, Feynman-Dyson perturbation theory, applications to many body problems, applications to quantum electrodynamics, elements of renormalization. (Oneda, Levinson)

PHYS 255. ADVANCED QUANTUM MECHANICS. (3)

Second semester. Prerequisite, PHYS 254. Renormalization of Lagrangian Field theories, Lamb Shift, Positronium fine structure, T. C. P. invariance, con-

nection between spin and statistics, broken symmetries in many body problems, soluble models, analyticity in perturbation theory, simple applications of dispersion relations. (Kim, Ferrell)

PHYS 257. THEORETICAL METHODS IN ELEMENTARY PARTICLES. (3)

First semester. Co-requisite, PHYS 255. (Sucher, Oneda)

PHYS 258. QUANTUM FIELD THEORY. (3)

Second semester. Co-requisite, PHYS 255. Introduction to Hilbert space, general postulates of relativistic quantum field theory, asymptotic conditions, examples of local field theory, Jost-Lehmann-Dyson representation and applications, generalized free field theory, general results of local field theory—TCP theorem, spin statistics connections, Borchers' theorems, Reeh-Schlieder theorem. (Greenberg, Oneda)

PHYS 260. HIGH ENERGY PHYSICS. (3)

Three lectures a week. Co-requisite, PHYS 254, or consent of instructor. Nuclear forces are studied by examining interactions at high energies. Meson physics scattering processes, and detailed analysis of high energy experiments. (Pati)

PHYS 262, 263. AEROPHYSICS. (3, 3)

Three lectures. Prerequisite, consent of the instructor. (Pai)

PHYS 290. CHARGED PARTICLE DYNAMICS, ELECTRON AND ION BEAMS. (3)

Three hours per week. Prerequisites, PHYS 127-128 or PHYS 104-105 or consent of instructor. General principles of single-particle dynamics; analytical and practical methods of mapping electric and magnetic fields; equations of motion and special solutions; Liouville's theorem; electron optics; space charge effects in high current beams; design principles of special electron and ion beam devices. (Reiser)

PHYS 399. RESEARCH.

Credit according to work done, each semester. Prerequisite, an approved application for admission to candidacy or special permission of the Department. (Staff)

(For Astronomy curriculum, see under ASTRONOMY, page 36.)

Special Physics Courses for High School Science Teachers

The courses in this section were especially designed for high school teachers and are not applicable to B.S., M.S. or Ph.D. degrees in physics without special permission of the Department of Physics and Astronomy. However, these courses can be included as part of a physics minor or as electives. No prerequisites are required.

PHYS 118A. ATOMS, NUCLEI, AND STARS. (3)

Three lectures per week. An introduction to basic ideas of the constitution and properties of atomic and subatomic systems and of the overall structure of the universe. (DeSilva)

PHYS 122A. PROPERTIES OF MATERIALS. (3)

Three lectures per week. An introduction to the study of solid state physics and the properties of fluids. (Narigle)

PHYS 160A. PHYSICS PROBLEMS. (1, 2, or 3)

Lectures and discussion sessions arranged. (DiLavore)

PHYS 170A. APPLIED PHYSICS. (3)

Three lectures per week.

(Hornyak)

**PHYS 199. NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTE FOR
TEACHERS OF SCIENCE SEMINAR. (1)**Arranged during summer session. Enrollment limited to participants in the
N.S.F. Summer Institute. (Staff)

PRE-PROFESSIONAL CURRICULA

Within the College of Arts and Sciences there are a number of programs developed to prepare the pre-professional student. These curricula, some rather general and others quite specific, are designed to give the student the best background to succeed in his advanced training, to fill undergraduate requirements of many professional schools, and to fit in with the requirements established by the organizations associated with the respective professions.

Pre-professional programs require that the student maintain a grade point average somewhat higher than the minimum for graduation. The student may fulfill requirements by majoring in almost any discipline in the College, provided the specific requirements of the pre-professional program are met. The successful completion of the pre-professional program does not guarantee admission to professional school. Each school has its own admissions requirements and criteria, generally based upon the grade point average in the undergraduate courses, the scores in aptitude tests (Medical College Admission Test, Law Admission Test, or Dental Aptitude Test), a personal interview, and letters sent by the "Evaluation Committee" of the College. For the specific admissions requirements, the student is urged to study the catalog of the professional school of his choice.

Although completion of the Bachelor's degree is a normal prerequisite for admission, three professional schools of the University of Maryland in Baltimore—Dentistry, Law, and Medicine—have arrangements whereby a student who meets requirements detailed below may be accepted for professional school after three years (90 academic hours). For the students to be eligible for the "combined degree," the final thirty hours prior to entry into the Schools of Dentistry, Law, and Medicine must be taken in residence in the College of Arts and Sciences. (A combined degree program in Law is also available in the College of Business and Public Administration: for details see BPA catalog.) After the successful completion of thirty hours of work in professional school, the student may be eligible for a Bachelor's degree from the College of Arts and Sciences (Arts-Dentistry, Arts-Law, or Arts-Medicine).

PRE-DENTISTRY

The pre-dental program is based upon requirements established by the Council of Dental Education of the American Dental Association, and the requirements for a degree from the College of Arts and Sciences following either the regular four-year program or the combined "Arts-Dentistry" program. The program is designed to prepare the student for the Dental Aptitude Test, normally taken in the spring of the sophomore year.

The minimum requirements for entry into dental school for either the three-year program (90 academic hours) or the four-year program (120 academic hours) are:

General Education requirements		34 hours
College requirements		
Foreign Language	12	
Speech	2	14 hours
plus		
Major		variable
Minor (or supporting courses)		variable
Dental Association requirements		
Chemistry—organic	8	
inorganic	8	
Zoology	8	
Mathematics	6	
Physics	8	38 hours

Electives—to complete the 90 or 120 hours required.

Required Health and Physical Education.

Four-Year Program. A student applies to Dental School in his senior year, on the basis of completing the usual degree requirements for the B.A. or B.S. degree from the College of Arts and Sciences, by majoring in the field of his choice and including in his course work the science courses specifically prescribed by dental schools.

Three-Year Arts-Dentistry Program. Students whose performance during the first two years in residence at College Park is exceptional may be encouraged to seek admission to the University of Maryland Dental School at the end of their third year (90 academic hours). No undergraduate major is required for this program: the work of the first year of dental school is considered as the major; but students will select a minor (supporting courses) from one of the following combinations: zoology, six hours above the 100 level; microbiology, eight hours above the 100 level; CHEM 019 plus three hours above the 100 level in any science; CHEM 161, 162, 163, and 164; or nine hours above the 100 level in any one department of the arts, humanities, or social sciences.

Students accepted in the combined Arts-Dentistry program may receive the B.S. degree (Arts-Dentistry) after satisfactory completion of the first year of dental school, upon recommendation by the Dean of the Dental School and approval by the College of Arts and Sciences. Applications for the diploma are made during the summer following the first year of dental school, and the degree is awarded with the August graduates.

Schedule. The pre-dental student, regardless of degree sought, includes in his first-year schedule CHEM 001, 003; ZOOL 001, 002; ENGL 001, 003; MATH 010, 011 (or 018, 019); HLTH 005; and Physical Education. His second year includes CHEM 035, 036, 037, 038; foreign language; general education requirements; and major-minor requirements. A student hoping for three-year acceptance would substitute PHYS 010, 011 for foreign language in his sophomore year. The University of Maryland Dental School also requires that the student include in his schedule ZOOL 005 and a course in statistics (either PSYC 090 or SOCY 095).

PRE-LAW

Although some law schools will consider only applicants with a B.A. or B.S. degree, others will accept applicants who have successfully completed a three-year program of academic work. Most law schools do not prescribe specific courses which a student must present for admission, but do require that the student follow one of the standard programs offered by the undergraduate college. Many law schools require that the applicant take the Law Admissions Test in the academic year preceding his entry into professional school.

Four-Year Program. The student who plans to complete the requirements for the B.A. or B.S. degree before entering law school should select a major field of concentration. The pre-law student ordinarily follows a Bachelor of Arts program with a major in American Studies, English, American and English history, economics, political science (government and politics), psychology, sociology or speech; a few pre-law students follow a Bachelor of Science program.

Three-Year Arts-Law Program. The student who plans to enter law school at the end of his third year should follow the general B.A. program during his first two years. During his junior year, he will complete the requirements for a minor (18 semester hours) in one of the fields of concentration. His program during the first three years should include all of the basic courses required for a degree from the College of Arts and Sciences (including the 18 hour minor) and all College and University requirements. The academic courses must total 90 hours, and must be passed with a minimum average of 2.0.

Students with exceptional records who are accepted to the School of Law of the University of Maryland under the Arts-Law program may receive a B.A. degree (Arts-Law) after satisfactory completion of the first year of law school, upon recommendation by the Dean of the Law School and approval by the College of Arts and Sciences. Applications for the diploma are made during the summer following the first year of law school (or after 30 credit hours are completed), and the degree is awarded with the August graduates.

PRE-MEDICINE

The pre-medical program is based upon the requirements established by the Association of American Medical Colleges and the requirements for a degree from the College of Arts and Sciences, either with the four-year degree program or with the combined "Arts-Medicine" program. The curriculum is designed to prepare the student for the Medical College Admission Test, which is normally taken in the spring of the junior year.

The minimum requirements for entry into medical school for either the three-year program (90 academic hours) or the four-year program (120 academic hours) are:

General Education requirements*		34 hours
College requirements		
Foreign Language	12	
Speech	2	14 hours
plus		

*Pre-medical students must offer PHIL 001 to fulfill the Fine Arts requirement of the General Education program.

Major		variable
Minor (or supporting courses)		variable
Medical School requirements		
Chemistry—general inorganic	8	
organic	8	
quantitative**	4	
Zoology	16	
(In addition to ZOOL 001		
and 002, strongly recommended		
are two of genetics,		
embryology, comparative		
anatomy)		
Mathematics	6	
Physics	8	50 hours
Electives—to complete the 90 or 120 hours required.		
Required Health and Physical Education.		

Four-Year Program. No specific major is required for favorable consideration by a medical school admissions committee. By intelligent planning starting in the sophomore year, the student can meet the above requirements as well as requirements of most majors in the College of Arts and Sciences. The student is urged to work closely with his pre-medical adviser for this planning. A student who enters the pre-medical program late in his college career may find an additional year of study necessary (either as a special student or as a regular undergraduate).

Three-Year Arts-Medicine Program. After completion of his first year of pre-medical study, an exceptional student may be encouraged to seek admission to the University of Maryland School of Medicine at the end of his third year (90 hours). During his next two years he will need to complete all requirements listed above, with the exception of the major and the regular minor. Four *additional* hours at the 100 level in appropriate science courses will satisfy the minor requirement.

Students accepted in the combined Arts-Medicine program may receive the B.S. degree (Arts-Medicine) after satisfactory completion of their training in the basic sciences at the University of Maryland School of Medicine (30 hours), upon recommendation of the Dean of the School of Medicine and approval by the College of Arts and Sciences. The degree is normally awarded in August following the *second* year of medical school.

Schedule. The pre-medical student normally includes in his first-year schedule CHEM 001, 003; ZOOL 001, 002; ENGL 001, 003; MATH 010, 011 (or 018, 019); HLTH 005; and Physical Education. Academically strong students may take an additional course in their second semester. His second year includes CHEM 035, 036, 037, 038; foreign language; General Education requirements; ZOOL 005, 006; and/or major requirements. His third year includes PHYS 010, 011; foreign language, General Education requirements, major requirements and minor (supporting course) requirements. CHEM 019 would be taken during the third year of the three-year applicant and during the fourth year of the four-year student. The fourth year is devoted to completion of the General Education requirements and major and minor (supporting course) requirements.

**Recommended but not required by the University of Maryland Medical School; required by some other medical schools.

RELATED PROFESSIONS

Academic preparation for several professions related to dentistry or medicine is available through the College of Arts and Sciences. For requirements of professional schools in dental hygiene, optometry, osteopathy, etc., see catalogs of the specialized schools; representative catalogs are available in the Office of the Dean.

Medical Technology. The program in medical technology is administered by the School of Nursing.

Veterinary Medicine. The pre-veterinary program is administered by the College of Agriculture.

PSYCHOLOGY

Professor and Chairman: BARTLETT.

Professors: ANDERSON, BRADY (P.T.), EDGERTON (P.T.), MCGINNIES, WALDROP.

Associate Professors: FISHER, GOLLUB, HORTON, MCINTIRE, PUMROY, STEINMAN, TURNAGE, WALDER, WARD, YARCZOWER.

Assistant Professors: FRETZ, GOLDSTEIN, HIGGS, HODOS, JOHNSON, LARKIN, SCHOLNICK, SMITH, TEITELBAUM, VETTER.

Instructor: HAFETZ.

Visiting Lecturer: GOLANN.

The Department of Psychology is classed in both the Division of Biological Sciences (B.S. degree) and the Division of Social Sciences (B.A. degree) and offers academic programs related to both of these fields. The undergraduate curriculum in psychology provides an organized study of the behavior of man in terms of the biological conditions and social factors which influence such behavior. In addition, the undergraduate program is arranged to provide a level of learning that will equip qualified students to pursue further study of psychology and related fields in graduate and professional schools.

Students who are interested in the biological aspects of behavior tend to choose a program leading to the B.S. degree, while those interested primarily in the social factors of behavior tend to choose a program leading to the B.A. degree. The choice of program is made in consultation with, and requires the approval of, the academic adviser.

Departmental requirements are the same for the B.S. and the B.A. degree. A minimum of 28 hours of psychology is required; courses taken must include PSYC 001, 090, 150 and two from 145, 146, and 147. The student must have a grade of not less than "C" in PSYC 001. (PSYC 001 cannot both be used to help satisfy the General Education requirement in social science and be included in the 28 hours of psychology.) The additional courses will be chosen in discussion with the adviser.

A minor program of 18 hours is organized to supplement the work in the major. For the B.S. degree supporting courses in the physical and biological sciences and mathematics will be chosen, in consultation with the adviser, to constitute a coherent set of courses. These courses will include at least three

semester courses of science and mathematics at the advanced level (at least 9 hours). Courses at the advanced level in science and mathematics are those beyond the first year sequence. A minimum of two semester courses must be laboratory courses. In addition to these 18 hours of supporting courses, the College of Arts and Sciences requires 12 hours of science and mathematics and these latter requirements are to be chosen in accordance with rules established by the College. For the B.A. degree the minor program will ordinarily consist of courses in the social sciences, although mathematics and other sciences may be included. Choice of the minor program is made in consultation with and requires the approval of the adviser. A minimum 2.0 grade average is required in the minor. No student who has ever received a second grade lower than a "C" in PSYC 001, 090, or any 100-level courses in psychology, will be certified for graduation in psychology.

HONORS

The Department of Psychology also offers a special program for the superior student which emphasizes independent study and research. Students may be eligible to enter the Honors Program who have a 3.3 grade average in all courses or the equivalent, who are in their junior or the first half of their senior year, and who demonstrate interest and maturity indicative of success in the program. Students should consult their adviser or the Departmental Honors Committee for further information.

PSYC 001. INTRODUCTION TO PSYCHOLOGY. (3)

A basic introductory course, intended to bring the student into contact with the major problems confronting psychology and the more important attempts at their solution. (Staff)

PSYC 005. PERSONALITY AND ADJUSTMENT. (3)

Prerequisite, PSYC 001. Introduction to the psychology of human personality and adjustment, with a view toward increasing self-understanding and developing an appreciation of the mental health movement and each individual's stake in it. (Staff)

PSYC 021. SOCIAL PSYCHOLOGY. (3)

Prerequisite, PSYC 001. Personality and behavior as influenced by culture and interpersonal relations. Social influences on motivation, learning, memory, and perception. Attitudes, public opinion, propaganda, language and communication, leadership, ethnic differences, and group processes. (Staff)

PSYC 025. CHILD PSYCHOLOGY. (3)

First semester. Prerequisite, PSYC 001. Behavioral analysis of normal development and normal socialization of the growing child. Leading theories of child nature and care, and their implications. (Staff)

PSYC 026. DEVELOPMENTAL PSYCHOLOGY. (3)

First semester. Prerequisite, PSYC 001. Biological basis of behavioral development in relation to genetic, constitutional, anatomical, physiological, and environmental factors. Emphasis upon both phylogenetic and ontogenetic research findings in biological psychology. (Brady, Hodos)

PSYC 090. STATISTICAL METHODS IN PSYCHOLOGY. (3)

First and second semester. Prerequisite, PSYC 001 and MATH 001, 005, or

010 or equivalent. A basic introduction to quantitative methods used in psychological research; measures of central tendency, of spread, and of correlation. (Staff)

For Advanced Undergraduates and Graduates

Graduate credits will be assigned for students certified by the Department of Psychology as qualified for graduate standing.

PSYC 110. EDUCATIONAL PSYCHOLOGY. (3)

Prerequisite, PSYC 001 or equivalent. Researches on fundamental psychological problems encountered in education. Measurement and significance of individual differences; learning, motivation, transfer of training, and the educational implications of theories of intelligence. (Staff)

PSYC 122. ADVANCED SOCIAL PSYCHOLOGY. (3)

Second semester. Prerequisites, PSYC 021 and 090 or consent of instructor. A systematic review of researches and points of view in regard to major problems in the field of social psychology. (McGinnies, Higgs, Ward)

PSYC 123. LANGUAGE AND SOCIAL COMMUNICATION. (3)

Second semester. Prerequisite, PSYC 021, senior standing, and consent of instructor. The nature and significance of verbal and non-verbal communication in social psychological processes including examination of relevant theoretical approaches to symbolic behavior. (Staff)

PSYC 131. ABNORMAL PSYCHOLOGY. (3)

Prerequisite, two courses in psychology, including PSYC 005. The nature, diagnosis, etiology, and treatment of mental disorders. (Staff)

PSYC 136. APPLIED EXPERIMENTAL PSYCHOLOGY. (3)

Second semester. Prerequisite, PSYC 001 or consent of instructor. A study of basic human factors involved in the design and operation of machinery and equipment. Organized for students in engineering, industrial psychology, and the biological sciences. (Anderson, Goldstein.)

PSYC 145. EXPERIMENTAL PSYCHOLOGY: SENSORY PROCESSES. (4)

Two lectures and two two-hour laboratory periods per week. Prerequisite, PSYC 090. Primarily for students who major or minor in psychology. A systematic survey of the laboratory methods, and techniques applied to sensory and perceptual processes. (Fisher, Steinman)

PSYC 146. EXPERIMENTAL PSYCHOLOGY: LEARNING, MOTIVATION AND PROBLEM SOLVING. (4)

Two lectures and two two-hour laboratory periods per week. Prerequisite, PSYC 090. Primarily for students who major or minor in psychology. The experimental analysis of learning and motivational processes. (Gollub, McIntire, Turnage)

PSYC 147. EXPERIMENTAL PSYCHOLOGY: SOCIAL BEHAVIOR. (4)

Two lectures and two two-hour laboratory periods per week. Prerequisite, PSYC 021 and PSYC 090 or equivalent. A laboratory course dealing with methods of studying behavior in the social context. Topics will include social perception and motivation, small groups, communication and persuasion. Consideration will be given to the techniques involved in laboratory experimentation, field studies, attitude scale construction, and opinion surveys. (McGinnies, Higgs, Ward)

PSYC 148. PSYCHOLOGY OF LEARNING. (3)

First semester. Prerequisite, PSYC 145 and permission; or PSYC 146. Review and analysis of the major phenomena and theories of human and animal learning, including an introduction to the fields of problem solving, thinking and reasoning behavior. (Staff)

PSYC 150. TESTS AND MEASUREMENTS. (3)

Prerequisite, PSYC 090. Critical survey of measuring devices used in counseling, educational and industrial practice with an emphasis on the theory, development and standardization. Laboratory work will incorporate training in methodology of test development together with appropriate practice in the use of selected tests. (Waldrop, Bartlett, Johnson)

PSYC 151. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES. (3)

Prerequisite, PSYC 150. Problems, theories, and researches related to psychological differences among individuals and groups.

(Waldrop, Johnson)

PSYC 161. INDUSTRIAL PSYCHOLOGY. (3)

Prerequisite, 6 hours in psychology. A course designed to aid in the understanding of the problems of people in a variety of work situations; serving as an introduction to such technical problems as personnel selection, interviewing, morale supervision and management, and human relations in industry. Lecture, discussion and laboratory. (Staff)

PSYC 180. PHYSIOLOGICAL PSYCHOLOGY. (3)

First semester. Prerequisite, PSYC 145 or 146. An introduction to research on the physiological basis of human behavior, including considerations of sensory phenomena, motor coordination, emotion, drives, and the neurological basis of learning. (Staff)

PSYC 181. ANIMAL BEHAVIOR. (3)

Second semester. Prerequisite, consent of instructor. A study of animal behavior, including considerations of social interactions, learning, sensory processes, motivation, and experimental methods, with a major emphasis on mammals. (McIntire)

PSYC 191. SENIOR SEMINAR. (3)

First semester. Prerequisites, senior standing and consent of the instructor. The historical and theoretical roots of the science of psychology. Analysis of current psychological theories and their related research. (Staff)

PSYC 194. INDEPENDENT STUDY IN PSYCHOLOGY. (1-6)

Prerequisites, senior standing and written consent of individual faculty supervisor. Integrated reading under direction leading to the preparation of an adequately documented report on a special topic. (Staff)

PSYC 195. MINOR PROBLEMS IN PSYCHOLOGY. (1-6)

Prerequisite, written consent of individual faculty supervisor. An individualized course designed to allow the student to pursue a specialized topic or research project under supervision. (Staff)

For Graduates

(All the following courses require consent of the instructor. Not all of the graduate courses are offered every year. The times specified for each course are given as estimates.)

- PSYC 200. PRO-SEMINAR: PROFESSIONAL ASPECTS OF PSYCHOLOGICAL SCIENCE. (1)**
Prerequisite, consent of faculty adviser. Survey of professional problems in psychology, including considerations of contemporary developments, professional ethics, literature resources, formulation of critical research problems, and discussion of the major institutions requiring psychological services.
(Staff)
- PSYC 201. SENSORY AND PERCEPTUAL PROCESSES. (3)**
Alternate years. Prerequisites, PSYC 180 and 211. The contemporary experimental and theoretical literature on selected problems in sensation and perception.
(Fisher, Steinman)
- PSYC 203, 204. GRADUATE SEMINAR. (2, 2)**
Surveys of contemporary American and foreign research literature in specialized fields of psychology.
(Staff)
- PSYC 205, 206. HISTORICAL VIEWPOINTS AND CURRENT THEORIES IN PSYCHOLOGY. (3, 3)**
Alternate years. Prerequisite, PSYC 212. A study of the philosophical and scientific background of modern psychology, together with a review of its major systematic viewpoints and issues.
(Anderson, Turnage)
- PSYC 207. CONDITIONING AND LEARNING. (3)**
Alternate years. Prerequisite, PSYC 212. The literature on the experimental analysis of behavior, with examination of basic experiments and contemporary theories related to them.
(Staff)
- PSYC 208. VERBAL BEHAVIOR. (3)**
Alternate years. Prerequisite, PSYC 123 and 212. Analysis of such topics as verbal learning, psycholinguistics, concept formation, and thinking.
(Horton, Turnage)
- PSYC 211, 212. ADVANCED GENERAL PSYCHOLOGY. (3, 3)**
Prerequisite, PSYC 145 or 146. A systematic review of the more fundamental investigations upon which modern psychology is based.
(Staff)
- PSYC 213. ADVANCED LABORATORY TECHNIQUES. (1-3)**
Methodology of the automatization of research techniques and apparatus; apparatus design and construction; telemetric and digital techniques; logical block circuitry.
(Staff)
- PSYC 214. COMPARATIVE PSYCHOLOGY. (3)**
Prerequisite, PSYC 181 and 212. The experimental literature on the behavior of infra-human organisms. Special topics.
(Yarczower, McIntire)
- PSYC 215. ADVANCED PSYCHOPHYSIOLOGY. (3)**
Alternate years. An advanced seminar dealing with special selected topics in the area of psychophysiology.
(Brady, Hodos, McIntire)
- PSYC 216. SEMINAR IN PSYCHOPHARMACOLOGY. (3)**
Prerequisite, one year of graduate study in psychology and consent of the instructor. A critical review and detailed analysis of the literature and problems related to the effects of drugs on animal and human behavior. Designed for advanced graduate students in experimental psychology and clinical psychology.
(Brady, Gollub)
- PSYC 220. PSYCHOLOGICAL CONCEPTS IN MENTAL HEALTH. (3)**
Prerequisite, advanced standing. Concepts in mental health, their theoretical status, experimental evidence, and current use.
(Golann, Fretz)

- PSYC 221. SEMINAR IN COUNSELING PSYCHOLOGY. (3)**
Selected problems in counseling psychology. (Fretz, Waldrop)
- PSYC 222. SEMINAR IN CLINICAL PSYCHOLOGY. (3)**
Selected problems in clinical psychology. (Pumroy, Walder)
- PSYC 223. SEMINAR IN COMMUNITY MENTAL HEALTH. (3)**
Selected problems in mental health psychology. (Golann)
- PSYC 224. SEMINAR IN STUDENT PERSONNEL. (2)**
(Same as EDUC 228.) Prerequisite, permission of instructor. The seminar is designed to acquaint the student with student personnel functions at the collegiate level. Attention is devoted to the historical antecedents of student personnel activities, the range of services, their functions, responsibilities, interrelationships and projected future status. Resource personnel presently engaged in student personnel services will participate as needed. (Staff)
- PSYC 225-226. BEHAVIORAL ASSESSMENT AND MEASUREMENT. (2, 2)**
First and second semesters. Prerequisite, PSYC 150. Logic and methodology of individual assessment and measurement. Survey of the major testing instruments and techniques. (Staff)
- PSYC 227-228. LABORATORY IN BEHAVIORAL ASSESSMENT AND MEASUREMENT. (2, 2)**
First and second semesters. Prerequisite, PSYC 150. Administration, scoring, interpretation, and use of current appraisal instruments and methods in evaluating a variety of age levels and types of cases, including referred cases from cooperating institutions. (Staff)
- PSYC 229. SEMINAR IN INDUSTRIAL PSYCHOLOGY. (3)**
An advanced seminar covering specialized topics such as morale and motivation, labor relations, consumer motivations, man-machine systems, quantitative and qualitative personnel requirements inventory, job evaluation, environmental conditions and safety, occupational choice and classification, and the interview. (Staff)
- PSYC 230. SEMINAR IN ENGINEERING PSYCHOLOGY. (3)**
Alternate years. An advanced seminar covering the analysis of factors, variables, and characteristics of systems which affect human performance and efficiency. (Anderson, Goldstein)
- PSYC 231. TRAINING PROCEDURES IN INDUSTRY. (3)**
Prerequisite, PSYC 148 or equivalent. A consideration of psychological principles and methods for improving job performance; skill development laboratory in application of methods and techniques is provided. (Bartlett, Goldstein)
- PSYC 232. PERSONNEL SELECTION AND JOB ANALYSIS. (3)**
Prerequisite, PSYC 161 or equivalent. Psychological measurement as applied to the analysis of job requirements and the development and use of performance criteria and predictors. (Bartlett)
- PSYC 233. SOCIAL ORGANIZATION IN INDUSTRY. (3)**
Analysis of management organizations as social structures, and the application of concepts and methods of social psychology to problems of conflict, cooperation, and leader-group relations. (Edgerton, Locke)
- PSYC 240. INTERVIEW AND QUESTIONNAIRE TECHNIQUES. (3)**
Psychological concepts and methods in the use of interview, questionnaire, and inventory procedures for the measurement, prediction and alternation of behavior. (Bartlett, Higgs)

PSYC 241. PERSUASION AND ATTITUDE CHANGE. (3)

Consideration of the communication process and the various media of mass communication. Factors related to the effectiveness of communication and persuasion are analyzed in the light of experimental evidence, and various strategies and techniques of persuasion are reviewed. (McGinnies)

PSYC 242. SEMINAR IN SOCIAL PSYCHOLOGY. (3)

Analysis and discussion of contemporary systematic positions in social psychology. Review of research methods in the area as well as theories and problems of current importance. (Higgs, McGinnies, Ward)

PSYC 243. SEMINAR IN SMALL GROUP BEHAVIOR. (3)

Review of current approaches to small group behavior, including problem-solving, communication, leadership, and conformity. (Ward)

PSYC 252, 253. ADVANCED STATISTICS. (3, 3)

Prerequisite, PSYC 090. Detailed study of the fundamentals of statistical inference, experimental design, and the analysis of regression and correlation concepts and techniques; a basic course for research students in the behavioral sciences. (Staff)

PSYC 254. FACTOR ANALYSIS. (3)

Prerequisite, PSYC 253. Analysis of major developments in factor theory as applicable to the behavioral sciences, including computational methods and research implications. (Staff)

PSYC 255. SEMINAR IN PSYCHOMETRIC THEORY. (3)

Prerequisite, PSYC 253. Study of psychophysical methods, scaling techniques, and the statistical methods of pattern analysis. (Staff)

PSYC 256. MENTAL TEST THEORY. (3)

Prerequisite, PSYC 253. Development of test theory from psychophysics and measurement theory. Consideration of formal and applied problems involved in developing and utilizing psychological tests and measurements. Special attention is given to problems of reliability, validity, and prediction. (Bartlett)

PSYC 257. SEMINAR IN QUANTITATIVE PSYCHOLOGY. (3)

Prerequisite, PSYC 253. An advanced seminar covering special topics in statistical and mathematical methods and models in psychology. (Staff)

PSYC 258. DEVELOPMENT OF PREDICTORS. (3)

Prerequisite, PSYC 253. Review of statistical theory and practices in the design, development and analysis of techniques of prediction in the behavioral sciences, with special attention to the formal and practical problems of criteria for prediction. (Bartlett)

PSYC 260. OCCUPATIONAL DEVELOPMENT AND CHOICE. (3)

Prerequisite, PSYC 220. Theoretical and research literature on occupational behavior. (Waldrop, Fretz)

PSYC 261, 262. MODIFICATION OF HUMAN BEHAVIOR: RESEARCH METHODS AND PRACTICES. (3, 3)

The experimental and applied methods available for the induction of behavior change, with emphasis on their relationship to community mental health (first semester); process, outcome, and theory in their application to counseling and psychotherapy (second semester). (Walder, Johnson)

- PSYC 263, 264. MODIFICATION OF HUMAN BEHAVIOR: LABORATORY AND PRACTICUM. (3)**
 Application of methods relevant to behavior change in counseling and psychotherapy. Individual supervision and group consultation. (Fretz, Pumroy)
- PSYC 265. ADVANCED DEVELOPMENTAL PSYCHOLOGY. (3)**
 Empirical, experimental and theoretical literature related to developmental processes. (Waldrop, Pumroy)
- PSYC 266. THEORIES OF MOTIVATION. (3)**
 Alternate years. Current treatments of motivational concepts, and analysis of the causal antecedents to behavior. (Staff)
- PSYC 267. THEORIES OF PERSONALITY. (3)**
 Scientific requirements for a personality theory. Postulates and relevant research literature for several current personality theories. (Walder, Vetter)
- PSYC 269. PRACTICUM IN COMMUNITY MENTAL HEALTH CONSULTATION. (3)**
 Directly supervised fieldwork in mental health consultation. (Golann)
- PSYC 270. ADVANCED ABNORMAL PSYCHOLOGY. (3)**
 Alternate years. Deviant behaviors and their etiology and taxonomy. (Vetter, Walder)
- PSYC 271. APPRAISAL OF DISABILITIES. (3)**
 Human disabilities and their psychological appraisal. (Waldrop)
- PSYC 272. INDIVIDUAL CLINICAL DIAGNOSIS. (3)**
 Alternate years. Prerequisite, PSYC 226. Case study of emotionally disturbed individuals with a variety of psychological techniques. (Staff)
- PSYC 274. EVALUATION AND CHANGE IN EDUCATIONAL SKILLS. (3)**
 Methods for the enhancement of reading and other educational skills. (Staff)
- PSYC 285, 286. RESEARCH METHODS IN PSYCHOLOGY. (1-3, 1-3)**
 Research is conducted on several problems each semester, in a variety of fields of psychology, and under the supervision of various members of the faculty. (Staff)
- PSYC 288, 289. SPECIAL RESEARCH PROBLEMS. (1-4, 1-4)**
 Supervised research on problems selected from the areas of experimental industrial, social, quantitative, or mental health psychology. (Staff)
- PSYC 399. RESEARCH. (CREDIT ARRANGED)**
 (Staff)

RUSSIAN AREA PROGRAM

Director: YANEY.

This program is for the student who wants to concentrate his studies in the humanities and the social sciences on the Russian area. It includes work in language and literature, history, government and politics, economics, and geography. The student may emphasize any one of these disciplines in completing his courses. The program prepares the student for graduate work in the Russian area, but by proper selection of courses a student may concentrate his work sufficiently in one discipline to be able to take up graduate work in this particular field.

The student following this program must meet the general requirements for a degree in the College of Arts and Sciences. He should select Russian to meet the foreign language requirements.

Required introductory courses are: RUSS 001, 002, 006 and 007 (unless the student is exempted from this requirement): HIST 041 and 042, GEOG 010 or 015, ECON 037 or 031, 032. These courses must be passed with at least an average grade of C in order for the student to continue in the program.

Advanced courses in the Russian Area: The student must complete at least 30 hours of advanced work in the Russian area including 12 hours of advanced courses in Russian language, 6 hours in Russian history, 6 hours in Russian government, 3 hours in Russian geography, and 3 hours in Soviet economics.

The student must complete an additional 18 hours of advanced work in the above disciplines. Of these 18, at least 12 must all be in one of the departments and at the 100 level. If the student wishes to concentrate in Russian language and literature, he should take at least 15 of these hours in Russian.

SOCIOLOGY AND ANTHROPOLOGY

Associate Professor and Executive Secretary: HIRZEL.

Associate Professor and Director of the Division of Anthropology: WILLIAMS.

Professor and Director of the Division of Criminology: LEJINS.

Professors: HOFFSOMMER, JANES, LEJINS.

Associate Professors: ANDERSON, CUSSLER, HIRZEL, HOFFMAN, AND WILLIAMS.

Assistant Professors: AVIS, COATES, FEDERICO, FRANZ, HARPER, HENKEL, HUNT, MCINTYRE, PEASE, SIMONS, AND WILSON.

Lecturers: ATHERTON, COURTLISS, GIBSON, GREEN, HULSE, AND LENGERMANN.

Instructors: DOERR, FLYNN, JAVUREK, SEDLACK, AND STANLEY.

SOCIOLOGY

SOCIOLOGY MAJOR

The major in Sociology offers: (1) A liberal education especially directed toward understanding the complexities of modern society and its social problems; (2) a broad preparation for various types of professions, occupations, and services dealing with people; (3) a more specific preparation in the areas in which the Department offers specialization such as criminology and corrections, social service, industrial and occupations, social psychology, social institutions, community studies, etc.; (4) preparation of qualified students for graduate training in Sociology. A comprehensive set of courses in Anthropology is provided by that Division (See pp. 26-29.) Statements on course requirements and recommended courses in these areas are available in the departmental office.

A minimum of 30 hours in Sociology is required of majors. Required courses include SOCY 001, 002, 095, 186, and 196. No course with a grade of less than a "C" can be used towards the major. Students interested in the honors program should check their eligibility with the Department's Honors Committee.

SOCY 001 or its equivalent is prerequisite to all other courses in Sociology.

SOCY 001: INTRODUCTION TO SOCIOLOGY. (3)

This course is one of the set of courses within the Social Science requirement of the General Education Program. Sociological analysis of the American social structure; metropolitan, small town, and rural communities; population distribution, composition and change; social organization. (Staff)

SOCY 002. PRINCIPLES OF SOCIOLOGY. (3)

Prerequisite, sophomore standing. The basic forms of human association and interaction; social processes; institutions; culture, human nature and personality. (Staff)

SOCY 013. RURAL SOCIOLOGY. (3)

Rural life in America; its people, social organization, culture patterns, and problems. (Hoffsommer)

SOCY 014. URBAN SOCIOLOGY. (3)

Urban growth and expansion; characteristics of city populations; urban institutions and personality patterns; relations of city and country. (Staff)

SOCY 051. SOCIAL PATHOLOGY. (3)

Prerequisite, sophomore standing. Personal-social disorganization and maladjustment; physical and mental handicaps; economic inadequacies; programs of treatment and control. (Franz, Staff)

SOCY 052. CRIMINOLOGY. (3)

Prerequisite, sophomore standing. Criminal behavior and the methods of its study; causation; typologies of criminal acts and offenders; punishment, correction, and incapacitation; prevention of crime. (Lejins, Wilson, Staff)

SOCY 062. SOCIAL INSTITUTIONS (3)

Prerequisite, sophomore standing. Nature and function of social institutions; the perpetuation of behavior through customs and social norms; typical contemporary American institutions. (Staff)

SOCY 064. COURTSHIP AND MARRIAGE. (3)

Prerequisite, sophomore standing. A sociological study of courtship and marriage including consideration of physiological and psychological factors. Intercultural comparisons and practical considerations. Designed for students in the lower division. (Harper)

SOCY 071. DYNAMICS OF SOCIAL INTERACTION. (3)

Social psychology of groups such as committees, teams, clubs, sects, social movements, crowds and publics. Origin of the social self; role behavior, inter-group and intra-group relations. (Cussler, Staff)

SOCY 095. INTRODUCTORY STATISTICS FOR SOCIOLOGY. (3)

(Two lectures and two hours drill per week.) Prerequisite, MATH 010 or equivalent. Elementary descriptive and inferential statistics. Measures of central tendency and variation, non-parametric and parametric measures of association and correlation, one-way analysis of variance, hypothesis testing, point and interval estimates. Required of all Sociology majors.

(Henkel, McIntyre, Simons, Staff)

*For Advanced Undergraduates and Graduates***SOCY 102. INTERCULTURAL SOCIOLOGY. (3)**

Prerequisite, SOCY 002. On the basis of a comparative study of customs, individual and group behavior patterns and institutions, this course studies the ideologies of America and other modern societies. (Franz)

SOCY 111. SOCIOLOGY OF OCCUPATIONS AND CAREERS. (3)

The sociology of work and occupational life in modern society. Changing occupational ideologies, values and choices. Occupational status systems and occupational mobility. The social psychology of career success.

(Lengermann, Coates)

SOCY 112. RURAL-URBAN RELATIONS. (3)

The ecology of population and the forces making for change in rural and urban life; migration, decentralization and regionalism as methods of studying individual and national issues. Applied field problems. (Hoffsommer)

SOCY 113. THE RURAL COMMUNITY. (3)

A detailed study of rural life with emphasis on levels of living, the family, school, and church and organizational activities in the fields of health, recreation, welfare, and planning. (Hoffsommer)

SOCY 114. THE CITY. (3)

The rise of urban civilization and metropolitan regions; ecological process and structure; the city as a center of dominance; social problems, control and planning. (Hirzel)

SOCY 115. INDUSTRIAL SOCIOLOGY. (3)

The sociology of human relations in American industry and business. Complex industrial and business organization as social systems. Social relationships within and between industry, business, community, and society. (Coates, Lengermann)

SOCY 116. MILITARY SOCIOLOGY. (3)

Social change and the growth of military institutions. Complex formal military organizations. Military organizations as social systems. Military service as an occupation or profession. The sociology of military life. Relations between military institutions, civilian communities and society. (Coates)

SOCY 118. COMMUNITY ORGANIZATION. (3)

Community organization and its relation to social welfare; analysis of community needs and resources; health, housing, recreation; community centers; neighborhood projects. (Federico)

SOCY 121. POPULATION. (3)

Population distribution and growth in the United States and the world; population characteristics of the United States; resulting population problems and policies. (Hirzel)

SOCY 122. POPULATION. (3)

Trends in fertility and mortality, migrations, population estimates and the resulting problems and policies. (Hirzel)

SOCY 123. ETHNIC MINORITIES. (3)

Basic social processes in the relations of ethnic groups within the State; immigration groups and the Negro in the United States; ethnic minorities in Europe. (Lejins, Staff)

SOCY 131. INTRODUCTION TO SOCIAL SERVICE. (3)

General survey of the field of social-welfare activities; historical development; growth, functions, and specialization of agencies and services, private and public. (Federico)

SOCY 136. SOCIOLOGY OF RELIGION. (3)

Varieties and sources of religious experience. Religious institutions and the role of religion in social life. (Staff)

SOCY 141. SOCIOLOGY OF PERSONALITY. (3)

Development of human nature and personality in contemporary social life; processes of socialization; attitudes, individual differences, and social behavior. (Cussler, Hunt, Simons)

SOCY 144. COLLECTIVE BEHAVIOR. (3)

Social interaction in mass behavior; communication processes; structure and functioning of crowds, strikes, audiences, mass movements, and the public.

(Cussler)

SOCY 145. SOCIAL CONTROL. (3)

Forms, mechanisms, and techniques of group influence on human behavior; problems of social control in contemporary society.

(Staff)

SOCY 147. SOCIOLOGY OF LAW. (3)

Law as a form of social control; interrelation between legal and other conduct norms as to their content, sanctions, and methods of securing conformity; law as an integral part of the culture of the groups; factors and processes operative in the formation of legal norms as determinants of human behavior.

(Lejins)

SOCY 153. JUVENILE DELINQUENCY. (3)

Juvenile delinquency in relation to the general problem of crime; analysis of factors underlying juvenile delinquency; treatment and prevention.

(Lejins, Wilson, Staff)

SOCY 154. CRIME AND DELINQUENCY PREVENTION. (3)

Prerequisite, SOCY 052 or SOCY 153 or consent of instructor. Methods and programs in prevention of crime and delinquency.

(Lejins, Wilson, Staff)

SOCY 155. TREATMENT OF CRIMINALS AND DELINQUENTS IN THE COMMUNITY. (3)

Prerequisite, SOCY 052, 153, or consent of instructor. Analysis of the processes and methods in the modification of criminal patterns of behavior in a community setting.

(Lejins, Wilson, Staff)

SOCY 156. INSTITUTIONAL TREATMENT OF CRIMINALS AND DELINQUENTS. (3)

Prerequisite, SOCY 052 or SOCY 153 or consent of instructor. History, organization and functions of penal and correctional institutions for adults and juveniles.

(Lejins, Wilson, Staff)

SOCY 161. THE SOCIOLOGY OF WAR. (3)

The origin and development of armed forces as institutions; the social causes, operations and results of war as social conflict; the relations of peace and war and revolution in contemporary civilization.

(Coates)

SOCY 162. SOCIAL STRATIFICATION. (3)

The study of the nature of stratification; indicators of social class position; social class correlates; social class mobility; social class and society.

(Pease)

SOCY 164. THE FAMILY AND SOCIETY. (3)

Study of the family as a social institution; its biological and cultural foundations, historic development, changing structure and function; the interactions of marriages and parenthood, disorganizing and reorganizing factors in present day trends.

(Harper)

SOCY 166. INTERVIEWING AND PROBLEM SOLVING IN SOCIAL WORK. (3)

Prerequisite, SOCY 131. The principles of interviewing and other diagnostic techniques as applied to social problems with particular reference to family and child behavior.

(Federico)

SOCY 171. FAMILY AND CHILD WELFARE. (3)

Programs of family and child welfare agencies; social services to families and children; child placement; foster families.

(Staff)

SOCY 173. SOCIAL SECURITY. (3)

The social security program in the United States; public assistance; social insurance.

(Staff)

SOCY 174. PUBLIC WELFARE. (3)

Development and organization of the public welfare movement in the United States, social legislation, interrelations of federal, state, and local agencies and institutions. (Staff)

SOCY 180. SMALL GROUP ANALYSIS. (3)

Analysis of small group structure and dynamics. Review of research on small groups in factories, military service, schools and communities. Presentation of techniques used in the study of small groups. (Franz)

SOCY 186. SOCIOLOGICAL THEORY. (3)

Development of the science of sociology; historical backgrounds; recent theories of society. Majors in sociology should take this course in their senior year. (Janes, Hunt)

SOCY 191. SOCIAL FIELD TRAINING. (1-3)

Prerequisites, for social work field training, SOCY 131; for crime control field training, SOCY 052 and 153. Enrollment restricted to available placements. Supervised field training in public and private social agencies. The student will select his particular area of interest and be responsible to an agency for a definite program of in-service training. Group meetings, individual conferences, and written program reports will be a required part of the course. (Staff)

SOCY 193. INDEPENDENT READING COURSE IN SOCIOLOGY. (3)

For honors students only. This course is designed for the needs of the honors students in Sociology. (Staff)

SOCY 194. INDEPENDENT RESEARCH IN SOCIOLOGY. (3)

For honors students only. This course is designed for the needs of the honors students in Sociology. (Staff)

SOCY 195. INTERMEDIATE STATISTICS FOR SOCIOLOGISTS. (3)

Prerequisite, SOCY 095 or equivalent and six additional credits in Sociology. Intermediate correlation techniques, analysis of variance, sampling, additional non-parametric techniques, additional topics in inferential statistics. Required of all candidates for the M.A. degree. (Henkel, Staff)

SOCY 196. INTRODUCTION TO RESEARCH METHODS IN SOCIOLOGY. (3)

Nature and scope of sociological research, problem formulation, case study method, observational methods, survey method, experimental methods, documentary methods, miscellaneous methods. (Cussler, Hoffsommer, McIntyre, Staff)

At least one seminar each in methods-statistics, theory, community, social psychology, and criminology will be offered each semester.

*For Graduates***SOCY 201. METHODS OF SOCIAL RESEARCH. (3)**

Selection and formulation of research projects; methods and techniques of sociological investigation and analysis. Required of graduate majors in sociology. (Hoffsommer)

SOCY 202. ADVANCED RESEARCH METHODS IN SOCIOLOGY. (3)

Prerequisite, SOCY 201 or equivalent. Instruction in more advanced methodology in sociological research. (McIntyre, Simons)

SOCY 204. PRACTICUM IN DATA ANALYSIS IN FIELD RESEARCH. (3)

Prerequisites, SOCY 195 and one course in methods. Field training in the conduct of research in an organized research setting. Supervised instruction in the

sequence of a total research project including preparation of research design, data collection, data coding, scaling, tabulation, and report writing.

(McIntyre, Staff)

SOCY 214. SURVEY OF URBAN THEORY. (3)

Prerequisite, SOCY 014 or 114 or equivalent. Theoretical approaches of Sociology and other social sciences to urbanism, urbanization, and urban phenomena. Selected approaches: Chicago School; metropolitan region; demography, institutions.

(Janes, Hirzel, Staff)

SOCY 215. COMMUNITY STUDIES. (3)

Intensive study of the factors affecting community development and growth, social structure, social stratification, social mobility and social institutions; analysis of particular communities.

(Hoffsommer)

SOCY 216. SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS. (3)

An analysis of the occupational and professional structure of American society, with special emphasis on changing roles, functions, ideologies and community-relationships.

(Coates, Lengermann)

SOCY 217. SEMINAR IN FIELD WORK URBAN RESEARCH. (3)

Prerequisite, SOCY 214. Methods of research in Sociology applied to the urban and metropolitan community, reviews of needed research, reviews of contemporary research; the design and execution of field studies.

(Janes, Hirzel, Staff)

SOCY 221. POPULATION AND SOCIETY. (3)

Selected problems in the field of population; quantitative and qualitative aspects; American and world problems.

(Hirzel)

SOCY 230. COMPARATIVE SOCIOLOGY. (3)

Comparison of the social institutions, organizations, patterns of collective behavior, and art manifestations of social values of selected countries.

(Franz)

SOCY 241. PERSONALITY AND SOCIAL STRUCTURE. (3)

Comparative analysis of the development of human nature, personality, and social traits in select social structures.

(Cussler, Hunt, Staff)

SOCY 246. PUBLIC OPINION AND PROPAGANDA. (3)

Processes involved in the formation of mass attitudes; agencies and techniques of communication; quantitative measurement of public opinion.

(Staff)

SOCY 250. FORMAL ORGANIZATION. (3)

An introduction to the study of organizations, the nature of organizations, types of organizations, determinants and consequences of organizational growth, determinants and consequences of growth for administrative staff, determinants of effectiveness and research in organizations.

(Pease)

SOCY 253. ADVANCED CRIMINOLOGY. (3)

Survey of the principal issues in contemporary criminological theory and research.

(Lejins, Wilson, Staff)

SOCY 254. SEMINAR: CRIMINOLOGY. (3)

Selected problems in criminology.

(Lejins, Wilson, Staff)

SOCY 255. SEMINAR: JUVENILE DELINQUENCY. (3)

Selected problems in the field of juvenile delinquency.

(Lejins, Wilson, Staff)

SOCY 256. CRIME AND DELINQUENCY AS A COMMUNITY PROBLEM. (3)

An intensive study of selected problems in adult crime and juvenile delinquency in Maryland.

(Lejins, Wilson, Staff)

SOCY 257. SOCIAL CHANGE AND SOCIAL POLICY. (3)

Emergence and development of social policy as related to social change; policy-making factors in social welfare and social legislation. (Staff)

SOCY 262. FAMILY STUDIES. (3)

Case studies of family situations; statistical studies of family trends, methods of investigation and analysis. (Harper)

SOCY 263. MARRIAGE AND FAMILY COUNSELING. (3)

Prerequisite, SOCY 064 or 164 or consent of instructor. A sociological analysis of an emerging, family-centered profession. Designed for advanced sociology majors of allied fields, for use in vocations such as teaching, medicine, the ministry and others embodying the role of guidance. (Staff)

SOCY 264. THE SOCIOLOGY OF MENTAL HEALTH. (3)

A study of the sociological factors that condition mental health together with an appraisal of the group dynamics of its preservation. (Staff)

SOCY 271. THEORY OF SOCIAL INTERACTION. (3)

Positions of major sociologists and social psychologists as to how the individual interacts with various groups and the issues involved. Trends in recent interaction theory. (Cussler)

SOCY 282. SOCIOLOGY METHODOLOGY. (3)

Logic and method of sociology in relation to the general theory of scientific method; principal issues and points of view. (Henkel)

SOCY 286. DEVELOPMENT OF EUROPEAN AND AMERICAN SOCIOLOGICAL THEORY. (3)

Prerequisite, SOCY 186 or equivalent. Review of systematic sociological theories (such as Positivism, Organicism, Conflict, etc.) from the early 19th Century to the present. A review of the emerging self-evaluation of Sociology. (Hunt, Janes, Staff)

SOCY 287. SEMINAR: SOCIOLOGICAL THEORY. (3)

Prerequisite, SOCY 186 or equivalent. Systematic examination of contemporary sociological theories such as structural functionalism and social action. Special reference is given to the relevance of each theory to the conduct of sociological investigation. (Janes)

SOCY 291. SPECIAL SOCIAL PROBLEMS. (Credit to be determined)

Individual research on selected problems. (Staff)

SOCY 295. ADVANCED STATISTICS FOR SOCIOLOGISTS. (3)

Prerequisite, SOCY 195 or equivalent. Advanced treatment of inferential statistics, sampling, research design, non-parametric techniques, scaling. Required of all candidates for the Ph.D. degree. (Henkel, Staff)

SOCY 399. THESIS RESEARCH. (Credit to be determined)

(Thesis Adviser)

SPEECH AND DRAMATIC ART

Professor and Chairman: STRAUSBAUGH.

Professors: HENDRICKS, PUGLIESE.

Associate Professors: AYLWARD, LANDFIELD, LINKOW, AND NIEMEYER.

Associate Research Professor: CAUSEY.

Assistant Professors: BAKER, CRAVEN, DOUDNA, FRANK, KIRKLEY, MEERSMAN, O'LEARY, PROVENSEN, SCHER, SCHMITT, SCHWARTZ, AND STARCHER.

Instructors: ANDERSON, BLOM, BLUM, BUENGER, CARTER, FITZGERALD, FORD, HAWBECKER, HUGHES, LEA, MCCLEARY, MENSER, ULRICH, WAGHELSTEIN, AND WATERS.

Lecturers: MAKAY, SPEUHLER.

The courses in this Department have two main functions: (1) to provide training in basic oral communication skills to meet the general needs of undergraduates of the University; (2) to provide integrated specialized training for students who wish to major or minor in speech.

The undergraduate program provides for specific emphasis in one of the four areas of the Department: (1) General Speech (speech education, persuasion, public address, oral interpretation, organizational and interpersonal communication), (2) Dramatic Art (educational theatre, acting, directing, producing, theatre history, and technical theatre), (3) Radio/Television (educational radio and television, programming, directing and producing); (4) Speech and Hearing Science (phonetics, semantics, speech and hearing therapy, speech pathology and audiology). Adequate preparation and training for graduate work is provided. Programs for various concentrations may be obtained from the departmental office or advisers.

Minors in speech are adapted to meet the needs of students majoring in English, the social sciences, journalism and public relations, elementary education, nursery school-kindergarten education, pre-law, and pre-ministry fields.

Prerequisites for all majors in speech are SPCH 001 and 002, as well as SPHR 003 or SPCH 004, and ZOOL 001. Major requirements: 30 hours of courses in speech with 15 hours of courses numbered 100 and above. No course with a grade less than "C" may be used to satisfy major requirements.

Specific requirements for professional training in speech and hearing science include completion of the general requirements for speech majors with the following additions: ZOOL 014, 015; PSYC 001, 005, 025, 110, 131; a minimum of 21 hours of speech sciences at the 100 level.

Qualified students, depending upon specialized interests, are invited to participate in the activities of the University Theater, Radio-Television Workshop, and the Calvert Debate Club.

HONORS

The Department of Speech and Dramatic Art offers an Honors Program for the superior student. Interested students should consult their adviser for further information no later than the beginning of their junior year.

GENERAL SPEECH

*SPCH 001. PUBLIC SPEAKING. (3)

Prerequisite for advanced speech courses. The preparation and delivery of

*SPHR 003 should be substituted for non-English speaking students.

short original speeches; outside readings; reports, etc. It is recommended that this course be taken during the freshman year. SPCH 001 and 007 may not both be used for credit. (Linkow, Staff)

SPCH 002. ADVANCED PUBLIC SPEAKING. (3)

Prerequisite, SPCH 001 or 007. A study of rhetorical principles and models of speech composition in conjunction with the preparation and presentation of specific forms of public address. (Schwartz, Staff)

SPCH 004. VOICE AND DICTION. (3)

First and second semesters. Emphasis upon the improvement of voice, articulation, and phonation. May be taken concurrently with SPCH 001.

(Starcher, Staff)

***SPCH 007. PUBLIC SPEAKING. (2)**

The preparation and delivery of speeches on technical and general subjects. SPCH 007 and 001 may not both be used for credit. (Schwartz, Staff)

SPCH 010. GROUP DISCUSSION. (3)

A study of the principles, methods, and types of discussion, and their application in the discussion of contemporary problems. (Linkow, Staff)

SPCH 011, 012. DEBATE. (2, 2)

Pre-Law students may take SPCH 011, 012, instead of SPCH 001 or SPCH 007. A study of the principles of argument, analysis, evidence, reasoning, fallacies, briefing, and delivery, together with their application in public speaking. (Fitzgerald, Staff)

SPCH 013. ORAL INTERPRETATION. (3)

The oral interpretation of literature and the practical training of students in the art of reading. (Provensen, Staff)

SPCH 021. FUNDAMENTALS OF SPEECH COMMUNICATION. (3)

First and second semesters. A study of oral communicative behavior, including problems and processes of symbolizations, aspects of oral language, the involvement of the talker and listener, kinds of signals, and self-revelation through speech. (Frank, Staff)

SPCH 023. PARLIAMENTARY LAW. (1)

A study of the principles and application of parliamentary law as applied to all types of meetings. Thorough training in the use of Robert's Rules of Order. (Strausbaugh)

For Advanced Undergraduates and Graduates

SPCH 107. ADVANCED ORAL INTERPRETATION. (3)

Prerequisite, SPCH 013. Emphasis upon the longer reading. Program planning. (Provensen)

SPCH 110. ADVANCED GROUP DISCUSSION. (3)

Prerequisite, SPCH 010. Required in speech curriculum and elective in other curricula. An examination of current research and techniques in the discussion and conference, including extensive practice in this area. (Linkow)

SPCH 111. SEMINAR. (3)

Prerequisites, senior standing and consent of instructor. Present-day speech research. (Strausbaugh, Staff)

SPCH 124, 125. AMERICAN PUBLIC ADDRESS. (3, 3)

Prerequisite, SPCH 001 or 007. The first semester covers the period from colonial times to the Civil War period. The second semester covers from the Civil War period through the contemporary period. (Schwartz)

* SPCH 003 should be substituted for non-English speaking students.

SPCH 133. COMMUNICATION PROCESSES IN CONFERENCES. (3)

Prerequisite, one course in public speaking. Limited to students at the off-campus centers. Group participation in conferences, methods of problem solving, semantic aspects of language, and the function of conferences in industry and government. (Linkow)

SPCH 161. ANCIENT RHETORIC. (3)

Second semester. Prerequisite, SPCH 002 or 011. The theories of speech-making and speech composition as propounded by the classical rhetoricians. Special attention is given to Plato, Aristotle, Socrates, Cicero, Quintillian, and St. Augustine. (Makay)

SPCH 163. MATERIALS AND PROGRAMS FOR THE DEVELOPMENT OF LISTENING. (3)

Second semester. The study of research finding, listening tests, materials, equipment, and programs which can be used to develop listening skills. (Frank)

SPCH 164. PERSUASION IN SPEECH. (3)

Second semester. Prerequisite, SPCH 002 or 011. A study of the bases of persuasion with emphasis on recent experimental developments in persuasion. (Schwartz)

SPCH 180. HONORS SEMINAR. (3)

For Honors students only. Readings, symposiums, visiting lecturers, discussions. (Staff)

For Graduates

SPCH 260. SPEECH AND DRAMA PROGRAMS IN HIGHER EDUCATION. (3)

A study of current theories and practices in speech education. (Frank)

SPCH 261. INTRODUCTION TO GRADUATE STUDY IN SPEECH. (3)

First semester. (Landfield)

SPCH 262. SPECIAL PROBLEMS IN GENERAL SPEECH. (3)

First semester. (Schwartz)

SPCH 263. RHETORICAL THEORIES OF STYLE. (3)

Second semester. Prerequisite, SPCH 124, 125, or 161. Examination of selected theories of style drawn from the fields of rhetoric and literature, and analysis of model speeches. (Staff)

SPCH 264. INTERPERSONAL COMMUNICATION. (3)

Second semester. Problems and processes of symbolic representation in speech, the effects of language on communication, semantic redundancy, and interaction between meaning and the structure of oral language. (Staff)

SPCH 290. INDEPENDENT STUDY. (1-3)

Prerequisite, consent of instructor. An individual course designed for intensive study or research of problems in any one of the three areas of drama, general speech, or radio/tv. (Staff)

SPCH 399. THESIS RESEARCH. (1-6)

(Staff)

DRAMATIC ART

DART 008. ACTING. (3)

Prerequisite, consent of instructor. Basic principles of histrionic practice. (Meersman)

DART 014. STAGECRAFT. (3)

Fundamentals of technical production. Emphasis on construction of scenery. (Ulrich)

DART 016. INTRODUCTION TO THE THEATRE. (3)

A general survey of the fields of the theatre.

(Pugliese)

DART 017. MAKE-UP. (2)

One lecture and one laboratory period a week. A lecture-laboratory course in the theory and practice of stage make-up, covering basic requirements as to age, type, character, race, and period.

(Schmitt)

*For Advanced Undergraduates and Graduates***DART 113. PLAY PRODUCTION. (3)**

Second semester. Prerequisite, DART 016 or consent of instructor. Development of procedure followed by the director in preparing plays for public performance.

(Meersman)

DART 114. THE FILM AS AN ART FORM. (3)

A study of the motion picture as a developing form of entertainment, communication, and artistic expression. A series of significant American and foreign films are viewed to illustrate the artistic, historical, and sociological trends of the twentieth century.

(Niemeyer)

DART 127. CHILDREN'S DRAMATICS. (3)

Principles and methods necessary for staging children's productions on the elementary school level. Major emphasis on creative dramatics; the application of creative dramatics in the school room, and the values gained by the child in this activity. Students will conduct classes in formal and creative dramatics which will culminate in children's programs.

(Hughes)

DART 129, 130. PLAY DIRECTING. (3, 3)

Prerequisite, DART 008 or consent of instructor. A lecture-laboratory course dealing with the fundamentals of script cutting, pacing, movement, blocking, and rehearsal routine as applied to the directing of plays.

(Landfield, O'Leary)

DART 131. HISTORY OF THE THEATRE. (3)

First semester. A survey of the dramatic production from early origin to 1800.

(Niemeyer)

DART 132. HISTORY OF THE THEATRE. (3)

Second semester. A survey of dramatic production from 1800 to the present.

(Niemeyer)

DART 139. THEATRE WORKSHOP. (3)

Prerequisite, DART 008 or 014. A laboratory course designed to provide the student with practical experience in all phases of theater production.

(Landfield)

DART 171. STYLES AND THEORIES OF ACTING. (3)

Second semester. Prerequisite, DART 008 or consent of instructor. The study and application of historical styles and theories of acting.

(Pugliese)

DART 175. STAGE DESIGN. (3)

Prerequisite, DART 014 or consent of instructor. The theory of stage design and lighting. Making of plans as coordinate elements of scenic design.

(Schmitt)

DART 176. PRINCIPLES AND THEORIES OF STAGE LIGHTING. (3)

Prerequisite, DART 175. A study of composition, control, and instrumentation in theatrical lighting.

(Schmitt)

DART 177. COSTUME DESIGN FOR THE STAGE. (3)

Prerequisite, DART 014 or consent of instructor. A historical and functional study of theatrical costume design.

(Waters)

For Graduates

DART 270. SEMINAR: STUDIES IN THEATRE. (3)

First semester. Research projects adapted to individual backgrounds and special work. (Meersman)

DART 271. THE THEORY OF PRE-MODERN DRAMATIC PRODUCTION. (3)

Second semester. A historical survey of production styles. (Pugliese)

DART 272. SPECIAL PROBLEMS IN DRAMA. (3)

Second semester. The preparation of adaptations and other projects in dramaturgy. (Pugliese)

DART 273. THEORIES OF THE DRAMA. (3)

Advanced study of the identification and development of dramatic form from the early Greek drama to contemporary forms; the esthetics of theatre arts; and dramatic criticism. (Landfield)

DART 275. THEORY OF VISUAL DESIGN FOR THE PERFORMING ARTS. (3)

Prerequisite, DART 175. A historical and theoretical study of design practices in the performing arts. (Schmitt)

RADIO AND TELEVISION

RATV 022. INTRODUCTION TO RADIO AND TELEVISION. (3)

Prerequisite for all courses in radio. The development, scope, and influence of American broadcasting and telecasting, including visits to local radio and television stations, with guest lecturers from radio and television stations. (Scher)

For Advanced Undergraduates and Graduates

RATV 102. RADIO PRODUCTION. (3)

Second semester. Prerequisites, RATV 022 and consent of instructor. A study of the multiple problems facing the producer. Special emphasis is given to acoustic setup, casting, "miking," timing, cutting, and the coordination of personnel factors involved in the production of radio programs. (Kirkley)

RATV 115. RADIO AND TELEVISION IN RETAILING. (3)

First semester. Limited to students in the College of Home Economics. Prerequisite, SPCH 001 or 007. Writing and production of promotional programs for the merchandising of wearing apparel and home-furnishings. Collaboration with the Washington and Baltimore radio stations and retail stores. (Kirkley)

RATV 117. RADIO AND TELEVISION CONTINUITY WRITING. (3)

Second semester. Prerequisite, RATV 022 or consent of instructor. A study of the principles, methods and limitations of writing for radio and television. Application will be made in the writing of general types of continuities and commercials. (Staff)

RATV 140. PRINCIPLES OF TELEVISION PRODUCTION. (3)

Prerequisite, 022. A study of the theory, methods, techniques, and problems of television production and direction. Units of study covering television cameras and lenses, lighting theory and practices, scenery and properties, costumes and makeup, graphic arts and special effects are included. Observation of production procedures at nearby television stations. Application will be made through crew assignments for University-produced television programs. (Staff)

RATV 146. TELEVISION NEWS AND PUBLIC AFFAIRS. (3)

First semester. Prerequisite, RATV 117 or JOUR 101. Training in presentation of television news, interviews, discussions, and forums. (McCleary)

RATV 147. ANALYSIS OF BROADCASTING PROCESSES AND RESULTS. (3)

First semester. Prerequisite, RATV 022 or consent of instructor. Survey of the more common analytic approaches, methods, and results in the field of radio and television. (Scher)

RATV 148. TELEVISION DIRECTION. (3)

Second semester. Two hour lecture, three hour laboratory. Prerequisites, RATV 022, 140. Principles of television direction including analysis of script, casting, rehearsing, production, and video control. (Aylward)

RATV 149. TELEVISION WORKSHOP. (3)

Second semester. Two hour lecture, four hour laboratory. Prerequisites, RATV 022, 140, and 148 or consent of instructor. (Aylward)

RATV 150. RADIO AND TELEVISION STATION MANAGEMENT. (2)

Second semester. Prerequisite, RATV 022 or consent of instructor. Broadcasting regulations, licenses, personnel functions, sales, advertising, and program and station promotion. (Kirkley)

RATV 151. BROADCAST PROGRAMMING AND CRITICISM. (3)

Second semester. An investigation of the professional, historical, social and psychological criticism of American radio and television, together with a critical analysis of contemporary programming trends and conventions. (Kirkley)

RATV 155. FILM PRODUCTION. (3)

Prerequisite, consent of instructor. A study of the theoretical and practical aspects of 16 mm film production. Through reading and practice, students are familiarized with basic cinematography, lighting, editing, pictorial composition and film continuity as a communication arts medium. (Staff)

*For Graduates***RATV 240. SEMINAR IN BROADCASTING. (3)**

First semester. Studies of various aspects of broadcasting. (Aylward)

RATV 241. SPECIAL PROBLEMS IN BROADCASTING. (3)

Second semester. An experimental laboratory course for the development of new ideas in broadcasting. (Scher)

RATV 248. ADVANCED TELEVISION DIRECTION. (3)

Second semester. Prerequisite, RATV 148 or consent of instructor. Principles of television direction as applied to dramatic programs, together with a consideration of the specific aesthetic values of the television medium. (Aylward)

SPEECH AND HEARING SCIENCE**SPEECH CLINIC. NO CREDIT.**

Remedial work in minor speech defects. The work of the clinic is conducted in individual conferences and in small group meetings. Hours arranged by consultation with the respective speech instructor. (Staff)

SPHR 3. FUNDAMENTALS OF GENERAL AMERICAN SPEECH. (3)

Training in auditory discrimination of speech sounds, rhythms and inflection of general American speech. Analysis of the physiological bases of speech production and the phonetic elements of speech reception. This course is required of majors in speech and hearing science and recommended for foreign students and majors in nursery and elementary education. (Hendricks, Staff)

*For Advanced Undergraduates and Graduates***SPHR 105. SPEECH-HANDICAPPED SCHOOL CHILDREN. (3)**

Prerequisite, SPHR 003 for undergraduates. The occurrence, identification, and treatment of speech handicaps in the classrooms. An introduction to speech pathology. (Staff)

SPHR 106. CLINICAL PRACTICE. (1 to 5 Credits, up to 9)

Prerequisites, SPHR 105 and consent of instructor. May be taken for 1-5 credit hours per semester. May be repeated for a total of 9 semester hours credit. Clinical practice in various methods of corrective procedures with various types of speech cases in the University clinic, Veterans hospitals, and public schools. (Craven)

SPHR 108. EDUCATIONAL PHONETICS. (3)

This course is designed to relate phonetic science to the classroom. An extensive coverage of broad transcription of general American speech. Students having credit for SPHR 003 or any previous phonetics course are not eligible for this course. (Hendricks)

SPHR 109. SPEECH AND LANGUAGE DEVELOPMENT OF CHILDREN. (3)

Second semester. Admission by consent of instructor. An analysis of normal and abnormal processes of speech and language development in children. (Hendricks)

SPHR 112. PHONETICS. (3)

Prerequisite, SPHR 003 or consent of instructor. Training in the recognition and production of the sounds of spoken English, with an analysis of their formation. Practice transcription. Mastery of the international phonetic alphabet. (Baker)

SPHR 120. SPEECH PATHOLOGY. (3)

First semester. Prerequisite, SPHR 105. A continuation of SPHR 105, with emphasis on the causes and treatment of organic speech disorders. (Staff)

SPHR 126. SEMANTIC ASPECTS OF SPEECH IN HUMAN RELATIONS. (3)

Second semester. Prerequisite, one course in public speaking. An analysis of speech and language habits from the standpoint of general semantics. (Hendricks)

SPHR 135. INSTRUMENTATION IN SPEECH AND HEARING SCIENCE. (3)

First semester. Prerequisite, 003. The use of electronic equipment in the measurement of speech and hearing. (Linkow)

SPHR 136. PRINCIPLES OF SPEECH THERAPY. (3)

Prerequisite, SPHR 120. Differential diagnosis of speech and language handicaps and the application of psychological principles of learning, motivation and adjustment in the treatment of speech disorders. (Craven)

SPHR 138. METHODS AND MATERIALS IN SPEECH CORRECTION. (3)

Prerequisite, SPHR 120 or the equivalent. The design and use of methods and materials for diagnosis, measurement, and retraining of the speech-handicapped. (Craven)

SPHR 141. INTRODUCTION TO AUDIOMETRY. (3)

First semester. Prerequisites SPHR 003, 135. Analysis of various methods and procedures in evaluating hearing losses. Required for students whose concentration is in speech and hearing therapy. (Doudna)

SPHR 142. SPEECH READING AND AUDITORY TRAINING. (3)

Second semester. Prerequisites, SPHR 135, 141. Methods of training indi-

viduals with hearing loss to recognize, interpret and understand spoken language. Required for students whose concentration is in speech and hearing therapy. (Doudna)

For Graduates

The department maintains a reciprocal agreement with the Veterans Administration whereby clinical practice may be obtained at the Audiology and Speech Pathology Clinic, Veterans Administration Hospital, 50 Irving St., N. W., Washington, D. C.

- SPHR 201. SPECIAL PROBLEMS SEMINAR. (A. THROUGH K.) (1, 3)**
 (6 hrs. applicable toward M. A. degree.) Prerequisites, 6 hours in speech pathology and consent of instructor. A. Stuttering; B. Cleft Palate; C. Delayed Speech; D. Articulation; E. Cerebral Palsy; F. Voice; G. Special Problems of the Deaf; H. Foreign Dialect; I. Speech Intelligibility; J. Neurophysiology of Hearing; K. Minor Research Problems. (Hendricks, Staff)
- SPHR 202. TECHNIQUES OF RESEARCH IN SPEECH AND HEARING. (3)**
 First semester. Prerequisite, 12 hours in speech pathology and audiology. Analysis of research methodology including experimental techniques, statistical analysis and preparation of reports for scientific investigations in speech and hearing science. Required of candidates for Master's degree in speech and hearing therapy. (Staff)
- SPHR 203. EXPERIMENTAL PHONETICS. (3)**
 Prerequisite, SPHR 112. The application of experimental methods in quantitative analysis of the phonetic elements of speech. (Baker)
- SPHR 204. APPLIED PHONETICS. (3)**
 Prerequisite, SPHR 112 or equivalent. Application of phonetic analysis to communication systems and clinical analysis in speech and hearing. (Baker)
- SPHR 205. ADVANCED EXPERIMENTAL PHONETICS. (3)**
 Prerequisites, SPHR 112 and SPHR 203. Application of phonetic analysis in experimental methodology utilizing electronic equipment for making spectrographic analyses of speech phenomena. (Baker)
- SPHR 206. DIAGNOSTIC PROCEDURES IN SPEECH PATHOLOGY. (3)**
 Prerequisite, 6 hours of speech pathology. A study of diagnostic tools and methods in the analysis of various types of speech disorders. (Hendricks, Staff)
- SPHR 207. ADVANCED PRINCIPLES OF SPEECH AND HEARING THERAPY. (3)**
 Prerequisite, SPHR 136 or equivalent, and 6 hours of speech and hearing pathology. A review of learning principles as applied to the training of the speech and hearing handicapped. (Hendricks)
- SPHR 208. QUANTITATIVE METHODS IN SPEECH AND HEARING SCIENCE. (3)**
 An analysis of current procedures used in quantifying phenomena observed in Speech and Hearing Science. A minimum of 12 hours credit in Speech and Hearing is a prerequisite for this course. (Staff)
- SPHR 210. ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING. (3)**
 Prerequisite, 6 hours in speech pathology and audiology and consent of instructor. A study of anatomy and physiology of the auditory and speech mechanisms. (Staff)
- SPHR 211. A, B, C, D. ADVANCED CLINICAL PRACTICE. (1, 3 UP TO 12)**
 (6 hours applicable toward M. A. degree.) Prerequisite, 12 hours in speech

pathology and audiology and permission of instructor. Supervised training in the application of clinical methods in the diagnosis and treatment of speech and hearing disorders. (Craven, Doudna)

SPHR 212. ADVANCED SPEECH PATHOLOGY. (3)

Prerequisites, 6 hours in speech pathology and consent of instructor. Etiology and therapy for organic and functional speech disorders. (Staff)

SPHR 214. CLINICAL AUDIOMETRY. (3)

Prerequisites, 3 hours in audiology and consent of instructor. Testing of auditory acuity with pure tones and speech. (Doudna)

SPHR 216. COMMUNICATION SKILLS FOR THE HARD-OF-HEARING. (3)

First semester. Prerequisites, 3 hours in audiology and consent of instructor. Speech reading, auditory training, and speech conservation problems in the rehabilitation of the hard-of-hearing. (Doudna)

SPHR 217. HEARING AID SELECTION FOR THE ACOUSTICALLY HANDICAPPED. (3)

Prerequisite, SPHR 214. A laboratory course in modern methods of utilizing electronic hearing aids. (Doudna)

SPHR 218. SPEECH AND HEARING IN MEDICAL REHABILITATION AND SPECIAL EDUCATION PROGRAMS. (3)

Second semester. Prerequisites, 6 hours in speech pathology and audiology and consent of instructor. Administrative problems involved in the organization and operation of speech and hearing therapy under the different types of programs. (Hendricks)

SPHR 219. SPEECH DISORDERS OF THE BRAIN-INJURED. (3)

Prerequisites, 6 hours in speech pathology and audiology and consent of instructor. Methods of evaluation and treatment of children and adults who have suffered injury to brain tissue, with subsequent damage to speech and language processes. (Hendricks)

SPHR 220. EXPERIMENTAL AUDIOLOGY. (3)

Second semester. Prerequisite, 6 hours in audiology. A study of experimental techniques in the investigation of problems in audiology and psychoacoustics. (Causey)

SPHR 221. COMMUNICATION THEORY AND SPEECH HEARING PROBLEMS. (3)

Second semester. Prerequisite, 6 hours in speech pathology and audiology and consent of instructor. Analysis of current theories of communication as they apply to research and therapy in speech and hearing. (Hendricks)

SPHR 222. ADVANCED BIO-ACOUSTICS. (3)

Prerequisite, 6 hours of audiology. Laboratory research methods in the study of hearing mechanisms in animals. (Spuehler)

SPHR 223. ADVANCED PSYCHO-ACOUSTICS. (3)

Prerequisite, 6 hours of audiology. Research methodology in the study of human hearing. (Causey)

SPHR 224. THE PREPARATION OF SPEECH AND HEARING SCIENTISTS IN INSTITUTIONS OF HIGHER LEARNING. (3)

Prerequisite, 6 hours of audiology and 6 hours of speech pathology. A review of problems involved in the training of personnel who expect to take teaching and research positions at university and college level. (Hendricks)

SPHR 225. ADVANCED SEMANTICS. (3)

Prerequisite, 3 hours of semantics. Advanced study of the effects of language in human perception. (Hendricks)

SPHR 226. LANGUAGE PROBLEMS OF THE EXCEPTIONAL CHILD. (3)

Prerequisite, 6 hours of speech pathology. A survey of special language problems of the mentally retarded, brain-injured, hard-of-hearing and deaf children. (Staff)

SPHR 227. EXPERIMENTAL DESIGN IN SPEECH AND HEARING SCIENCE. (3)

A seminar devoted to planning and conducting experiments in speech and hearing science. Each student is required to present three pilot studies for discussion. Two hours classwork, two hours laboratory. Permission of instructor required. (Staff)

SPHR 229. CLINICAL AND SOCIO-ECONOMIC ASPECTS OF HEARING LOSS. (3)

Prerequisite, SPHR 214. Social, economic, legal, medical, hearing conservation, and social welfare aspects of hearing loss for adults. Laboratory work will include identification and monitoring audiometry as well as practical clinical audiology. (Doudna)

SPHR 301. INDEPENDENT STUDY IN SPEECH AND HEARING SCIENCE. (1-6)

Student-selected topic of investigation. A proposed topic must be approved prior to registration. In addition to a formal report an oral presentation of the results will be required. May be repeated. Prerequisite, 30 hours of graduate study in speech and hearing science. (Staff)

ZOOLOGY

Professor and Acting Chairman: JACHOWSKI.

Professors: ANASTOS, EVANS, GROLLMAN, OTTO, AND SCHLEIDT.

Professor Emeritus: BURHOE.

Research Professors: CRONIN,* GLINOS, HUMPHREY, KOO,* KUNTZ, AND SADUN.

Associate Professors: BERNSTEIN, BRINKLEY, BROWN, GAINER, HIGHTON, LINDER, AND RAMM.

Research Associate Professors: EISENBERT, FLYGER,* SCHWARTZ,* AND SPRAGUE.*

Assistant Professors: CONTRERA, HAILMAN, IMBERSKI, MORSE, NELSON, AND POTTER.

Research Associates: DOSS AND FARR.

Lecturer: MCINTOSH.

Instructors: IMPEKOVEN, KAUFMAN, MOORE, NARDELL, AND STEWART.

The Department of Zoology offers a program leading to a B.S. with a major in Zoology. A core of required courses and restricted electives in zoology, as well as supporting courses in other fields, provides an introduction to, and an appreciation of, the broad field of zoology. Through selection of additional elective courses to complete the required 34 credit hours in zoology, the student may explore in greater depth some phase of zoology which is of particular interest to him. Copies of suggested curricula for students interested in preparation for graduate study in various phases of zoology or in pre-medical, pre-dental and biological technician training are available from the departmental office.

All majors are required to complete a minimum of 34 hours in zoology with an average grade of "C." Required courses include ZOOL 001, 002, 005, 006 and one course from each of the following groups: Group I, ZOOL 102, 103,

* Staff, Natural Resources Institute, University of Maryland.

104, 105, 108, 109; Group II, ZOOL 110, 118, 120, 127, 129; Group III, ZOOL 106, 121, 128, 130, 182, 190.

Supporting courses must include MATH 010, 011, Introduction to Mathematics (3, 3), or MATH 019, Elementary Analysis (4); PHYS 010, 011, Fundamentals of Physics (4, 4); CHEM 001, 003, General Chemistry (4, 4); CHEM 031, 033 (6) or CHEM 035, 036, 037, 038, Organic Chemistry (8); and one of the following courses or course sequences: MATH 014, 015, Calculus (6) or MATH 020, 021, Analysis (8); CHEM 019, Quantitative Analysis (4); BOTN 002 (4); or MICB 001 (4). It is strongly recommended that the supporting courses in chemistry and mathematics be completed as early in the curriculum as possible. Students desiring to enter graduate study in certain areas of zoology are advised to take biochemistry, physical chemistry, statistics or advanced mathematics as a part of their undergraduate training.

HONORS

The Department of Zoology also offers a special program for the exceptionally talented and promising student. The Honors Program emphasizes the scholarly approach to independent study rather than adherence to a rigidly prescribed curriculum. Information regarding this program may be obtained from the departmental office or from the Chairman of the Zoology Honors Program.

For Undergraduates

ZOOL 001. GENERAL ZOOLOGY. (4)

Three lectures and one two-hour laboratory period a week. ZOOL 001 and 002 satisfy the freshman pre-medical requirement in general biology. An introduction to the modern concepts of biological principles and animal life. Emphasis will be placed upon the functional aspects of living systems with a survey of the physical and chemical bases of all life processes. (Linder, Brown)

ZOOL 002. THE ANIMAL PHYLA. (4)

Two lectures and two two-hour laboratory periods a week. Prerequisite, ZOOL 001 or BOTN 001. A study of the anatomy, classification and life histories of representative animals, invertebrates and vertebrates. (Hailman, Nelson)

ZOOL 005. COMPARATIVE VERTEBRATE MORPHOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, ZOOL 001 and 002 or equivalent. A comparative study of the evolution of vertebrate organ systems supplemented by laboratory dissection and demonstrations. (Morse)

ZOOL 006. GENETICS. (4)

Second semester. Two lectures, one discussion period, and one two-hour laboratory period a week. Prerequisite, one course in zoology or botany. A consideration of the basic principles of heredity. (Potter)

ZOOL 014. HUMAN ANATOMY AND PHYSIOLOGY. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, ZOOL 001. For students who desire a general knowledge of human anatomy and physiology. (Grollman)

ZOOL 015. HUMAN ANATOMY AND PHYSIOLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, ZOOL 014. A continuation of ZOOL 014. (Bernstein)

ZOOL 055S. DEVELOPMENT OF THE HUMAN BODY. (2)

Summer session. Five lectures a week. A study of the main factors affecting the growth and development of the child with special emphasis on normal development. (Staff)

ZOOL 075. HISTORY OF ZOOLOGY. (1)

First semester. One lecture a week. Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor. A course in the history of the development of zoology involving the historical figures, experiments and ideas which contributed to modern concepts. (Staff)

ZOOL 076. ZOOLOGICAL LITERATURE. (1)

Second semester. One lecture a week. Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor. Discussion of zoological literature, its use and significance. (Staff)

ZOOL 077. BASIC STUDY IN ZOOLOGY. (1-4)

Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor. Independent study, with supporting laboratory experiments, of the basic disciplines in zoology. Repeatable up to 8 hours credit. (Staff)

*For Advanced Undergraduates and Graduates***ZOOL 102. VERTEBRATE PHYSIOLOGY. (4)**

First semester. Three lectures and one three-hour laboratory period a week. Prerequisites, one year of zoology and one semester of organic chemistry. An intensive study of nerve, muscle, sensory receptors and the central nervous system. (Gainer)

ZOOL 103. BIOPHYSICS. (3)

Second semester. Three lectures a week. Prerequisites, one year of biology, a year of physics, and at least one semester of calculus; or permission of the instructor. A course in the biophysics of excitable cells, utilizing a fairly rigorous physical-chemical approach to the study of the mechanisms of action of such cells. (Staff)

ZOOL 104. VERTEBRATE PHYSIOLOGY. (4)

Second semester. Three lectures and one three-hour laboratory period a week. Prerequisites, one year of zoology and one semester of organic chemistry. An intensive study of the cardiovascular, gastrointestinal, renal and respiratory systems, and an introduction to endocrinology, basal metabolism and reproductive physiology. (Contrera)

ZOOL 105. GENERAL ENDOCRINOLOGY. (3)

Second semester. Three lectures each week. Prerequisites, one year of zoology and one semester of organic chemistry. The study of the functions and the functioning of the endocrine organs of animals, with special reference to the vertebrates. (Brinkley)

ZOOL 106. GENETIC SYSTEMS. (3)

Second semester. Three lectures a week. Prerequisites, a course in genetics, one year of organic chemistry and MATH 011 or equivalent. A detailed description of the interactions of the genetic system. (Staff)

ZOOL 108. ANIMAL HISTOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of zoology. A microscopic study of tissues and organs

of vertebrates with special emphasis on the mammal. Practice in elementary histotechnique will be included. (Staff)

ZOOL 109. CELL BIOLOGY. (4)

First semester. Two lectures, one one-hour demonstration-discussion period and one three-hour laboratory period a week. Prerequisites, two years of zoology and a year of organic chemistry, or permission of the instructor. A study of cell structure and function with an emphasis on the activity of subcellular organelles and the mechanisms of coordination and control of cell function.

(Brown)

ZOOL 110. GENERAL PARASITOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, two years of zoology and one year of chemistry, or permission of the instructor. A consideration of the phenomenon of parasitism through a study of the structure, function and host relationships of parasitic organisms.

(Jachowski)

ZOOL 118. INVERTEBRATE ZOOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of zoology. An advanced course dealing with the phylogeny, morphology and embryology of the invertebrates, exclusive of insects.

(Staff)

ZOOL 120. VERTEBRATE EMBRYOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of zoology. Principles of developmental dynamics including organization, differentiation, morphogenesis, and developmental physiology.

(Ramm)

ZOOL 121. ANIMAL ECOLOGY. (3)

Second semester. Two lectures and one three-hour laboratory period a week. Prerequisite, one year of zoology. The environment and its control of animal abundance, organization of populations, and the biology of communities will be studied.

(Morse)

ZOOL 127. ICHTHIOLOGY. (4)

Second semester. Two lectures and one two-hour and one three-hour laboratory period a week. Prerequisites, ZOOL 001, 002 and 005 or equivalent. A course in anatomy, embryology, distribution, habits and taxonomy of marine and fresh water fish.

(Staff)

ZOOL 128. ZOOGEOGRAPHY. (3)

First semester. Three lectures a week. Prerequisites, ZOOL 001, 002, and 005 or equivalent. Principles governing the geographical distribution of animals, with particular emphasis on vertebrates.

(Potter)

ZOOL 129. VERTEBRATE ZOOLOGY. (4)

First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, two years of zoology or permission of instructor. The identification, classification, habits and behavior of vertebrates.

(Staff)

ZOOL 130. HYDROBIOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of biology or permission of instructor. Study of aquatic animals and conditions of existence in water. Selected examples are used to illustrate the influence of environment on productivity of aquatic communities.

(Staff)

ZOOL 150. SPECIAL PROBLEMS IN ZOOLOGY. (1 or 2)

Prerequisites, major in zoology or biological sciences, a minimum of 3.0 cumulative average in the biological sciences, and consent of instructor. Research or

integrated reading in zoology. A student may register several times and receive up to 8 semester hours of credit. (Staff)

ZOOL 151H. HONORS SEMINAR. (1)

One discussion period a week. Prerequisite, participation in honors program. Guided discussion of topics of current interest. Repeatable to total of 4 hours credit. (Staff)

ZOOL 152H. HONORS INDEPENDENT STUDY. (1-4)

Prerequisite, participation in honors program. Study of classical material by way of guided independent study and laboratory experiments. Repeatable to a total of 12 hours credit. (Staff)

ZOOL 153H. HONORS RESEARCH. (1-2)

Prerequisite, participation in honors program. A laboratory research problem which is required each semester during honors participation and culminates in a honors thesis. Repeatable to a total of 8 hours credit. (Staff)

ZOOL 182. ETHOLOGY. (4)

Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, two years of zoology, including a course in comparative anatomy, or permission of instructor. The function, causation, and evolution of behavior. Laboratory analysis of the behavior of several species. (Hailman)

ZOOL 190. EVOLUTION. (3)

First semester. Three lectures a week. Prerequisite, a course in genetics or permission of instructor. A consideration of current thought in regard to the origin and evolution of living organisms. (Highton)

For Graduates

ZOOL 201. COMPARATIVE PHYSIOLOGY. (4)

First semester. Three lectures and one three-hour laboratory period a week. Prerequisites, one year of zoology, one year of organic chemistry and one semester of physiology. The study of the differences and similarities in the functioning of organs of species of the animal kingdom. (Brinkley)

ZOOL 203. ADVANCED EMBRYOLOGY. (4)

First semester. Two lectures and four hours of laboratory a week. Prerequisites, a course in embryology and a course in physiology. The biochemical basis of development. (Ramm)

ZOOL 204. CELLULAR PHYSIOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, a course in animal or plant physiology, one year of organic chemistry, one year of physics, and a course in biochemistry. Recommended, ZOOL 109 or an equivalent course in cytology or cell biology. A study of the structure and function of cells on the molecular, subcellular and cellular levels by investigations and discussions of their physical, chemical, and microscopic properties. (Bernstein)

ZOOL 205. COMPARATIVE INVERTEBRATE ENDOCRINOLOGY. (3)

Second semester. Three lectures a week. Prerequisites, one year of organic chemistry, a course in endocrinology and a course in physiology, or permission of the instructor. A systematic approach to the structure and physiology of neuro-endocrine systems of invertebrates. (Linder)

ZOOL 206. ELECTROPHYSIOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, a course in physiology, one year of physics, and permission of the

instructor. A course concerned with electrical phenomena occurring in living matter and with the effect of electrical currents on cells, with special emphasis on nerves and muscles. (Gainer)

ZOOL 207. ZOOLOGY SEMINAR. (Arranged)

One seminar a week for each credit hour. 1. cytology; 2. embryology; 3. fisheries; 4. genetics; 5. parasitology; 6. physiology; 7. systematics; 8. ecology; 9. behavior; 10. recent advances; and 11. endocrinology. (Staff)

ZOOL 208. SPECIAL PROBLEMS IN ZOOLOGY. (Arranged)

1. cytology; 2. embryology; 3. fisheries; 4. genetics; 5. parasitology; 6. physiology; 7. systematics; 8. ecology; 9. behavior; 10. general; and 11. endocrinology. (Staff)

ZOOL 210. SYSTEMATIC ZOOLOGY. (4)

First semester. Three lectures and one three-hour laboratory period a week. The principles and methods involved in the classification of animals, with emphasis on population dynamics and speciation. Methods of evaluating taxonomic data, principles of zoological nomenclature, field and museum techniques, and the factors influencing the distribution of animals are also stressed. (Highton)

ZOOL 211, 212. LECTURES IN ZOOLOGY. (1-3, 1-3)

One, two, or three lectures a week. Advanced lectures by outstanding authorities in their particular field of zoology. As the subject matter is continually changing, a student may register several times, receiving credit for several semesters. (Visiting Lecturers)

ZOOL 215. SOCIOBIOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, a course in behavior and permission of the instructor. The course will deal with the description and analysis of animal social organizations, the adaptive nature of animal societies, the effects of early experience, and the role of communication in the integration of animal groups. (Eisenberg)

ZOOL 216. PHYSIOLOGICAL CYTOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, one year of biochemistry and physics, a course in physiology, or permission of the instructor. A study of the structure and function of cells by chemical, physical and microscopic methods. (Brown)

ZOOL 220. POPULATION GENETICS. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, a course in genetics. The role of mutation, selection, migration, inbreeding, and stochastic process in evolution. (Highton)

ZOOL 221. ECOLOGICAL GENETICS. (4)

First semester. Two lectures and six hours of laboratory a week. Prerequisites, a course in genetics and a course in ecology, or permission of the instructor. Analysis of the interactions between genotype and environment in natural and experimental populations of animals. (Staff)

ZOOL 223. ANALYSIS OF ANIMAL STRUCTURE. (4)

First semester. Two lectures and four hours of laboratory a week. Prerequisite, a course in embryology. The experimental basis of developmental mechanics. (Ramm)

ZOOL 234. EXPERIMENTAL MAMMALIAN PHYSIOLOGY. (4)

Second semester. Two four-hour laboratory periods a week. Prerequisites, a course in physiology and one year of chemistry above general chemistry. The

theory, use and application to research of instrumentation normally found in the physiology laboratory with an introduction to surgical techniques on both large and small animals. (Grollman)

ZOOL 235. COMPARATIVE BEHAVIOR. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, usually a course in behavior and one in physiology, and permission of the instructor. Orientation and migration, communication, coding, brain and behavior, biological rhythms, and hormones and behavior are the main subjects that will be considered. (Schleidt)

ZOOL 236. MAMMALIAN PHYSIOLOGY. (3)

Three lectures a week. Prerequisite, a course in physiology. Advanced study of the functioning of the organs of mammalian species. (Staff)

ZOOL 237. COMPARATIVE VERTEBRATE ENDOCRINOLOGY. (3)

Second semester. Three lectures each week. Prerequisite, one semester of biochemistry, physiology and endocrinology. Study of the differences and similarities in the structure and functioning of the endocrine organs of the vertebrate species. (Brinkley)

ZOOL 240. ANALYSIS OF ANIMAL POPULATIONS. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, a course in ecology or permission of instructor. An advanced course in animal ecology with a focus on population. Studies of growth and regulation of animal populations are emphasized. (Staff)

ZOOL 245. BIOLOGY OF BIRDS. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, a course in vertebrate zoology or permission of instructor. Emphasis will be on ecology, behavior, anatomy, systematics, and reproductive physiology, plus field studies of local birds. (Staff)

ZOOL 250. EXPERIMENTAL PARASITOLOGY. (4)

Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, a course in parasitology and permission of the instructor. Experiments will be performed utilizing living parasites in laboratory animals to illustrate various aspects of the host-parasite relationship. (Jachowski)

ZOOL 251. HELMINTHOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, two years of zoology and permission of the instructor. A study of the classification, structure and biology of the helminths. (McIntosh)

ZOOL 252. PROTOZOOLOGY. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, one year of zoology and permission of the instructor. A study of the classification, structure and biology of the protozoa. (Otto)

ZOOL 253. PHYSIOLOGY OF SYMBIOSIS. (4)

First semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, one year of biochemistry and permission of instructor. A consideration of the biology of symbiotic organisms, especially the physiological concert existing between host and symbiont. (Staff)

ZOOL 260. QUANTITATIVE ZOOLOGY. (4)

Second semester. Three lectures and one three-hour laboratory period a week. Prerequisites, MATH 019 or equivalent and permission of the instructor. A consideration of the statistical techniques of principal importance in the analysis of biological data. (Staff)

ZOOL 300. ADVANCED TOPICS IN PARASITOLOGY. (Arranged)

Prerequisites, advanced graduate standing and permission of the instructor. The content of the course changes frequently and students may register for it several times. The course will consist of critical discussions of the published literature and current problems in parasitology. 1. host-parasite relationships; 2. ecology of parasites; 3. immunity to parasites; and 4. physiology of parasites.

(Staff)

ZOOL 399. RESEARCH. (Arranged)

Work on thesis project only. 1. cytology; 2. embryology; 3. fisheries; 4. genetics; 5. parasitology; 6. physiology; 7. systematics; 8. ecology; 9. behavior; 10. invertebrate zoology; and 11. endocrinology.

(Staff)



The Faculty 1968-1969

Administrative Officers

- MANNING, Charles, Dean of the College of Arts and Sciences and Professor of English
B.S., Tufts College, 1929; M.A., Harvard University, 1931; Ph.D., University of North Carolina, 1950.
- LAFFER, Norman C., Associate Dean of the College of Arts and Sciences and Professor of Microbiology
B.S., Allegheny College, 1929; M.S., University of Maine, 1932; Ph.D., University of Illinois, 1937.
- BOYD, Alfred C., Jr., Assistant to the Dean of the College of Arts and Sciences and Assistant Professor of Chemistry
B.S., Canisius College, 1951; M.S., Purdue University, 1953; Ph.D., 1957.
- CATE, Allen G., Assistant to the Dean of the College of Arts and Sciences and Assistant Professor of English
B.A., Rutgers University, 1960; M.A., Duke University, 1962; Ph.D., 1967.
- NORTON, Ann E., Assistant to the Dean of the College of Arts and Sciences and Assistant Professor of Foreign Languages
B.A., Syracuse University, 1945; M.A., 1947.

Faculty

- A'HEARN, Michael F., Assistant Professor of Astronomy
B.S., Boston College, 1961; Ph.D., University of Wisconsin, 1966.
- ALLEN, Frank C., Instructor of English
B.A., University of Maryland, 1961; M.A., New York University, 1963.
- ALLEY, Carroll O., Jr., Associate Professor of Physics
B.S., University of Richmond, 1948; M.A., Princeton University, 1951; Ph.D., 1962.
- ALLGOOD, William T., Instructor of Music
B.Mus., East Carolina College, 1964; M.Mus., University of Illinois, 1965.
- ANASTOS, George, Professor and Chairman of Zoology
B.S., University of Akron, 1942; M.A., Harvard University, 1947; Ph.D., 1949.
- ANDERSON, Frank G., Associate Professor of Anthropology
A.B., Cornell University, 1941; Ph.D., University of New Mexico, 1951.
- ANDERSON, J. Robert, Assistant Professor of Physics
B.S., Iowa State University, 1955; Ph.D., 1963.
- ANDERSON, Kathryn L., Instructor of Speech and Dramatic Art
B.A., University of Iowa, 1965; M.A., 1967.
- ANDERSON, Nancy S., Professor of Psychology
B.A., University of Colorado, 1952; M.A., Ohio State University, 1953; Ph.D., 1956.

- ANDREADIS, Harriette**, Lecturer in English
B.A., Temple University, 1961; M.A., 1963.
- ANDREWS, Mary L.**, Associate Professor Emerita of English
B.S., New York University, 1929; M.A., 1935; Ph.D., 1941.
- APITZ, Elly F.**, Instructor of Foreign Languages
B.A., Goucher College, 1958; M.A., The Johns Hopkins University, 1959.
- ARMSTRONG, Douglas H.**, Instructor of Foreign Languages
B.A., Middlebury College, 1949; M.A., 1955.
- ARMSTRONG, James C.**, Assistant Professor of Physics
B.S., Duke University, 1953; Ph.D., University of Pittsburgh, 1960.
- ATHERTON, Barbara L.**, Instructor of Music
B.Mus., University of Maryland, 1965; M.Mus., 1967.
- ATHERTON, Douglas G.**, Lecturer in Sociology
B.A., Georgetown University, 1963; M.A., The Catholic University of America, 1965.
- ATKINSON, Gordon**, Professor of Chemistry
B.S., Lehigh University, 1952; Ph.D., Iowa State University, 1956.
- AUSLANDER, Joseph**, Professor of Mathematics
B.S., Massachusetts Institute of Technology, 1952; M.S., University of Pennsylvania, 1953; Ph.D., 1957.
- AVERY, William T.**, Professor and Chairman of Classical Languages and Literatures
B.A., Western Reserve University, 1934; M.A., 1935; Ph.D., 1937; Fellow of the American Academy in Rome, 1937-39.
- AVIS, Virginia**, Assistant Professor of Sociology
B.A., University of New Mexico, 1955; M.A., University of Chicago, 1958; Ph.D., 1959.
- AYLWARD, Thomas J.**, Associate Professor of Speech and Dramatic Art
B.S., University of Wisconsin, 1947; M.S., 1949; Ph.D., 1960.
- AZAR, Ines**, Instructor of Foreign Languages
Licenciatura, University of Buenos Aires.
- BAILEY, William J.**, Research Professor of Chemistry
B.S., University of Minnesota, 1943; Ph.D., University of Illinois, 1946.
- BAKER, Donald J.**, Assistant Professor of Speech and Dramatic Art
B.S., Ohio State University, 1954; M.A., 1956; Ph.D., 1962.
- BANERJEE, Manoj K.**, Professor of Physics
B.Sc., Patna University (India), 1949; M.Sc., Calcutta University, 1951; Ph.D., 1956.
- BARDASIS, Angelo**, Assistant Professor of Physics
B.A., Cornell University, 1957; M.S., University of Illinois, 1959; Ph.D., 1962.
- BARILLARI, Joseph P.**, Lecturer in History
B.A., College of Wooster, 1962; M.A., Washington University, 1963.
- BARNES, Jack C.**, Associate Professor of English
B.A., Duke University, 1939; M.A., 1947; Ph.D., University of Maryland, 1954.
- BARNETT, Ronald J.**, Instructor of Music
B.Mus., Eastman School of Music, 1960.

- BARTLETT, Carole W.**, Instructor of Foreign Languages
B.A., Bryn Mawr College, 1956; M.A., Yale University, 1957; M.A., Stanford University, 1964.
- BARTLETT, Claude J.**, Professor and Chairman of Psychology
B.S., Denison University, 1954; M.A., Ohio State University, 1956; Ph.D., 1958.
- BASA, Eniko M.**, Instructor of English
B.A., Trinity College (Washington), 1962; M.A., University of North Carolina, 1965.
- BATHURST, Jean M.**, Instructor of English
B.A., University of Wisconsin, 1945; M.A., Northwestern University, 1956.
- BAUER, Richard H.**, Professor of History
B.A., University of Chicago, 1924; M.A., 1928; Ph.D., 1935.
- BEAGLEHOLE, David**, Assistant Professor of Physics
B.Sc., Victoria University of Wellington (New Zealand), 1959; M.Sc., 1960; Ph.D., Cambridge University, 1964.
- BEALL, Edgar F.**, Assistant Professor of Physics
B.A., University of California (Berkeley), 1958; Ph.D., 1962.
- BEALL, Otho T., Jr.**, Professor of English and Director of American Studies
B.A., Williams College, 1930; M.A., University of Minnesota, 1933; Ph.D., University of Pennsylvania, 1952.
- BEATTY, Yvonne J.**, Instructor of Music
B.Mus., Michigan State University, 1953; M.Mus., University of Michigan, 1956.
- BEAUCHAMP, Virginia W.**, Instructor of English
B.A., University of Michigan, 1942; M.A., 1948; Ph.D., University of Chicago, 1955.
- BELL, A. Robert**, Instructor of English
B.A., University of Miami, 1960; M.A., 1962.
- BELL, Roger A.**, Assistant Professor of Physics and Astronomy
B.Sc., University of Melbourne, 1957; Ph.D., Australian National University, 1962.
- BELLAMA, Jon Michael**, Assistant Professor of Chemistry
A.B., Allegheny College, 1960; Ph.D., University of Pennsylvania, 1965.
- BELZ, Herman J.**, Assistant Professor of History
A.B., Princeton University, 1959; M.A., University of Washington, 1966; Ph.D., 1966.
- BENEDETTO, John J.**, Assistant Professor of Mathematics
B.A., Boston College, 1960; M.A., Harvard University, 1962; Ph.D., University of Toronto, 1964.
- BENEDICT, William S.**, Visiting Research Professor of Molecular Physics
A.B., Cornell University, 1928; A.M., 1929; Ph.D., Massachusetts Institute of Technology, 1933.
- BENESCH, William M.**, Professor of Molecular Physics
B.A., Lehigh University, 1942; M.A., The Johns Hopkins University, 1950; Ph.D., 1952.
- BENNETT, Lawrence H.**, Associate Professor of Physics
B.A., Brooklyn College, 1951; M.S., University of Maryland, 1955; Ph.D., Rutgers University, 1958.

- BERG, Kenneth R.**, Assistant Professor of Mathematics
B.S., University of Minnesota, 1960; Ph.D., 1967.
- BERG, Richard E.**, Assistant Professor of Physics
B.S., Manchester College, 1960; M.S., Michigan State University, 1963; Ph.D., 1966.
- BERMAN, Joel H.**, Associate Professor of Music
B.S., Julliard School of Music, 1951; M.A., Columbia University, 1953; D.M.A., University of Michigan, 1961.
- BERNHARDT, Miriam E.**, Instructor of Mathematics
B.S., University of Maryland, 1953.
- BERNSTEIN, Emil O.**, Associate Professor of Zoology
B.A., Syracuse University, 1951; M.S., 1953; Ph.D., University of California (Los Angeles), 1956.
- BERNSTEIN, Melvin**, Associate Professor of Music and Director of General Education Program
A.B., Southwestern at Memphis, 1947; B.Mus., 1948; M.Mus., University of Michigan, 1949; M.A., University of North Carolina, 1954; Ph.D., 1964.
- BETTINGER, Richard T.**, Assistant Professor of Physics
B.S., Syracuse University, 1955; Ph.D., University of Maryland, 1965.
- BEVERIDGE, Charles E.**, Assistant Professor of History
A.B., Harvard University, 1956; M.S., University of Wisconsin, 1959; Ph.D., 1966.
- BEYERMANN, Klaus**, Visiting Lecturer in Chemistry
Vordiplom (B.S.), Universitat Mainz, 1952; Diplom (M.S.), 1954; Doktorexamen (Ph.D.), 1957.
- BHAGAT, Satindar T.**, Associate Professor of Physics
B.A., Jammu and Kashmir University, 1950; M.Sc., University of Delhi, 1953; Ph.D., 1956.
- BINGHAM, Alfred J.**, Professor of Foreign Languages
B.A., Yale University, 1933; Ph.D., Columbia University, 1939.
- BIRDSALL, Esther K.**, Assistant Professor of English
B.A., Central Michigan College, 1947; M.A., University of Arizona, 1950; Ph.D., University of Maryland, 1958.
- BLOM, Eric D.**, Instructor of Speech and Dramatic Art
B.S., Miami University, 1966; M.A., Ball State University, 1967.
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COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

1968-1970

THE
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University Calendar 1968-1969

SPRING SEMESTER, 1968

FEBRUARY	5-9	Monday-Friday	Spring Semester Registration
	12	Monday	Instruction begins
	22	Thursday	Washington's Birthday, holiday
APRIL	11	Thursday	After last class—Easter recess begins
	16	Tuesday	8:00 a.m.—Easter recess ends
MAY	29	Wednesday	Last Class Meetings
	30	Thursday	Memorial Day, holiday
	31-June 7	Friday-Friday	Spring Semester Examinations
JUNE	8	Saturday	Commencement Exercises

SUMMER SCHOOL, 1968

JUNE	24-25	Monday-Tuesday	Summer School Registration
	26	Wednesday	Instruction begins
JULY	4	Thursday	Independence Day, holiday
	6	Saturday	Classes (Thursday schedule)
AUGUST	16	Friday	Summer School ends

SHORT COURSES, 1968

JUNE	17-21	Monday-Friday	College Week for Women
AUGUST	5-9	Monday-Friday	4-H Club Week
SEPTEMBER	3-6	Tuesday-Friday	Firemen's Short Course

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m.—Christmas recess ends
	15	Wednesday	After last class—end of instruction
	17-24	Friday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
APRIL	3	Thursday	After last class—Spring recess begins
	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
	23-25	Monday-Wednesday	State Vocational Agriculture Teachers Conference
AUGUST	5-8	Tuesday-Friday	Maryland 4-H Conference
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

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THE FUTURE OF THE UNIVERSITY



DONALD W. O'CONNELL, DEAN

The College

THE UNIVERSITY OF MARYLAND IS FAVORABLY LOCATED FOR THE ACCOMMODATION of students interested in business and public administration. Students interested in economics, geography, information systems management, journalism, and political science, find a similarly distinct advantage in being at College Park. Downtown Washington is only 25 minutes away in one direction, while the Baltimore business district is less than an hour in the other. There is frequent transportation service from College Park to each city. Qualified students may obtain a firsthand view of the far-flung economic and political activities of the national government and may utilize the libraries and other facilities available in Washington.

The College's six instructional departments offer a broad range of curricula in professional fields and in social science disciplines. The separate programs of study frequently draw upon courses in complementary fields within the College. The six departments and the major departmental offerings are:

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 2. Accounting
 3. Finance
 4. Insurance and Real Estate
 5. Marketing
 6. Personnel and Industrial Relations
 7. Production Management
 8. Statistics
 9. Transportation
 10. Combined Business Administration and Law
- II. Department of Economics
- III. Department of Geography
- IV. Department of Government and Politics
 1. General Curriculum in Government and Politics
 2. International Affairs
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- V. Department of Journalism
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- VII. Bureau of Business and Economic Research
- VIII. Bureau of Governmental Research
- IX. Affiliated Governmental Organizations
 1. Maryland Municipal League

Academic Information

Degrees

The University confers the following degrees on students completing programs of study in departments of the College: Bachelor of Science, Master of Arts, Master of Business Administration, Doctor of Business Administration, and Doctor of Philosophy. Each candidate for a degree must file in the Office of the Registrar on a date announced for each semester a formal application for a degree. Candidates for degrees must attend a convocation at which degrees are conferred and diplomas are awarded. Degrees are confirmed *in absentia* only in exceptional cases.

Graduation Requirements

A minimum of 120 semester hours of credit with an average of "C" in courses suggested by the College in addition to the specified courses in physical activities and health are required for graduation. A minimum of 57 hours of the required 120 hours must be in upper division courses, with the exception that the student may, with the consent of the Dean, offer certain lower division courses in mathematics, natural science, and foreign language in partial fulfillment of the requirement. Usually the departments within the College will require that the student have, in addition to an overall "C" average, an average of "C" or better in those courses comprising the student's departmental area of study. The time normally required to complete the requirements for the bachelor's degree is eight semesters.

Junior Standing

To earn junior standing a student enrolled prior to June, 1965, must complete 56 semester hours of academic credit with an average grade of "C" (2.0) or better. In computing this average, the following provisions apply: all academic courses carrying one or more credits which have been taken up to the time of computation shall be included; courses carrying "O" credit shall not be included; courses with grade "F" shall be included; courses in physical education required of all University students, and the health course required of all students shall not be included.

Students enrolled during or after the summer session of academic year 1965-1966: Students in this category must achieve the minimum requirements for retention and graduation set forth in the *General and Academic Regulations*, 1967-69, pages 68-71. Copies of this publication are available from the Director of Admissions and Registrations, North Administration building.

Detailed regulations pertaining to junior standing are presented in full in the publication, *General and Academic Regulations*.

Senior Residence Requirement

After a student has earned acceptable credit to the extent of 90 semester hours exclusive of the required work in physical activities, and hygiene, either at the University of Maryland or elsewhere, he must earn a subsequent total of at least 30 semester hours with an average grade of "C" or better at the University of Maryland. No part of these credits may be transferred from another institution. Specific requirements for graduation in the selected curriculum must be met.

Air Science Instruction

Air Science is offered at the University of Maryland on a completely elective basis. The Department of Air Science offers a 2-year and a 4-year program, either of which qualifies a student for a commission in the United States Air Force on graduation. Financial assistance is provided for students in the Advanced program.

Selected students who wish to do so may, with proper approval, carry as electives during their junior and senior years Advanced Air Science courses which lead to a commission in the United States Air Force. For further details concerning Air Science, refer to *General and Academic Regulations*, a publication available to all entering undergraduate students.

General Educational Program

A college education implies something more than an adequate technical training in the student's field of specialization. In order that each graduate with a Bachelor's degree may gain a liberal education as well as a specialized one, the University has established a General Education Requirement. This requirement consists of 34 semester hours of credit in six general fields. There is a wide choice in specific courses which may be used to satisfy requirements in all of the six fields except English. Physical Education and Health requirements for all students are taken in addition to this 34-hour group of courses. Although the courses in the General Education Program are prescribed generally, some choice is permitted, especially for students who demonstrate in classification tests good previous preparation in one or more of the required subjects. For a more complete description of the program refer to *General and Academic Regulations*, pages 50-53.

General Information

Detailed information concerning the General Education Program, fees and expenses, scholarships and awards, student life, and other material of a general nature, may be found in the University publication titled *An Adventure in Learning*. This publication may be obtained on request from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park 20742. A detailed explanation of the regulations of student and academic life may be found in the University publication titled, *University General and Academic Regulations*. This is mailed in September and February of each year to all new undergraduate students.

Requests for course catalogs for the individual schools and colleges should be directed to the deans of these respective units, addressed to:

COLLEGES LOCATED AT COLLEGE PARK:

Dean
(College in which you are interested)
The University of Maryland
College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean
(School in which you are interested)
The University of Maryland
Lombard and Greene Streets
Baltimore, Maryland 21201

Costs

Actual annual costs of attending the University include \$300.00 fixed charges; \$104.00 special fees; \$480.00 board; \$300.00 lodging for Maryland residents, or \$440.00 for residents of other states and countries. A matriculation fee of \$10.00 is charged all new students. A charge of \$450.00 is assessed to all students who are non-residents of the State of Maryland.

A fee of \$10.00 must accompany a prospective student's application for admission. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee.

An Adventure in Learning, the undergraduate bulletin of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park 20742.

Admission

FALL SEMESTER

All applications for full-time undergraduate admission for the Fall Semester at the College Park campus must be received by the University on or before June 1. Any student registering for nine or more semester hours of work is considered a full-time student for billing purposes.

Under unusual circumstances, application will be accepted between June 1 and September 1. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. This means that the applicant's educational records, SAT scores (in the case of new freshmen) and medical examination report must be received by August 1.

SPRING SEMESTER

The deadline for the receipt of applications for the Spring Semester is January 1.

UNIVERSITY COLLEGE

The application deadlines and fees *do not* apply to students registering in the evening classes offered by the University College.

GRADUATE SCHOOL

Application for admission to the Graduate School must be made by September 1 for the fall term and by January 1 for the spring term on blanks obtained from the Office of the Graduate School. Admission to the summer session is governed by the date listed in the Summer School catalog. The summer session deadline date is generally June 1.

Entrance Requirements

Requirements for admission to the College are those of the University.

To assure a likelihood of success in the College, it is recommended that the student have four units of English, three or more units of College Preparatory Mathematics—including a *minimum* of two units of Algebra and one unit of Geometry, one or more units of History and Social Science, two or more units of Natural Science, and two or more units of Foreign Language. Students expecting to enroll in the College of Business and Public Administration should pursue the pre-college program in high school.

Financial Aid and Assistance

The College has a number of graduate assistantships in the Departments of Business Administration, Economics, Geography, Journalism, and Government and Politics, and in the Bureau of Business and Economic Research and the Bureau of Governmental Research. Applications for assistantships should be made directly to the Dean of the College of Business and Public Administration. (See the *Graduate School Catalog* for rules and regulations).

Honors, Awards and Scholarships

THE DEAN'S LIST OF DISTINGUISHED STUDENTS

Any student who has passed at least 12 hours of academic work in the preceding semester, without failure of any course, and with an average grade on all courses of at least 3.5 will be placed on the Dean's List of Distinguished Students.

BETA GAMMA SIGMA

The Alpha of Maryland Chapter of Beta Gamma Sigma was chartered in 1940. The purpose of this honorary society is to encourage and reward scholarship and accomplishment among students of commerce and business administration; to promote the advancement of education in the art and science of business; and to foster integrity in the conduct of business operations. Chapters of Beta Gamma Sigma are chartered only in schools holding membership in the American Association of Collegiate Schools of Business. Third and fourth year students in business administration are eligible; if in his third year, a student must rank in the highest four percent of his class, and if his fourth year, he must rank in the highest ten percent in order to be considered for selection.

THE DELTA SIGMA PI SCHOLARSHIP KEY

This is awarded annually to the student who has maintained the highest scholastic standing during the entire course of study in business administration or economics. Delta Sigma Pi was founded at New York University on November 7, 1907. The Gamma Sigma of Maryland chapter was chartered at the University of Maryland in 1950. Delta Sigma Pi is a professional fraternity organized to foster the study of business in universities; to encourage scholarship, social activity, and the association of students for their mutual advancement by research and practice; to promote closer affiliation between the commercial world and students of commerce; and to further a high standard of commercial ethics and culture, as well as the civic and commercial welfare of the community. Members are selected from the College of Business and Public Administration on the basis of leadership, scholastic standing and promise of future business success.

KAPPA TAU ALPHA

The Maryland chapter of Kappa Tau Alpha was chartered in 1961. Founded in 1910, this national honorary society has 39 chapters at universities offering graduate or undergraduate preparation for careers in professional journalism. It is dedicated to recognition and promotion of scholarship in journalism. Among its activities is an annual award for an outstanding piece of published research in journalism and mass communications.

MARYLAND-DELAWARE PRESS ASSOCIATION ANNUAL CITATION

This award is presented to the outstanding senior in journalism.

PHI CHI THETA KEY

The Phi Chi Theta Key is awarded to the outstanding graduating senior woman in Business Administration or Business Education Administration on the basis of scholarship, activities, and leadership.

PUBLIC RELATIONS SOCIETY OF AMERICAN ANNUAL CITATION

The Baltimore Chapter of the Public Relations Society of America awards an annual citation to the top graduating senior in Journalism who has an interest in public relations.

THE WALL STREET JOURNAL STUDENT ACHIEVEMENT AWARD

This is awarded annually to the graduating senior who has maintained the highest scholastic achievement in the field of financial administration. The award consists of a silver medal and one year's subscription to *The Wall Street Journal*.

Scholarships

THE ALCOA FOUNDATION SCHOLARSHIP in the amount of \$500 is awarded to a junior majoring in Transportation with a special interest in industrial traffic management.

THE ALUMNI ASSOCIATION of the University provides a scholarship of \$250.

THE BALTIMORE SUNPAPERS Scholarships in Journalism are awarded to two deserving students. The scholarships, in the amount of \$500 each, are contributed by the Board of Trustees of the A. S. Abell Foundation, Inc., and are awarded to seniors majoring in editorial journalism.

THE BALTIMORE NEWS-AMERICAN provides two \$500 journalism scholarships. The Delmarva Traffic Club makes available a scholarship of \$250 for an outstanding transportation student in the junior class making his home on the Delmarva peninsula.

FEDERAL GOVERNMENT ACCOUNTANTS ASSOCIATION of Washington awards a scholarship in the amount of \$300 to a full-time undergraduate majoring in accounting.

THE HASKINS & SELLS FOUNDATION, INC., makes available a scholarship of \$500 for an exceptional senior student concentrating in accounting who is registered in the College of Business and Public Administration. In addition to the cash award, a token award in the form of an inscribed silver medallion will be given to each award winner.

THE MARYLAND ASSOCIATION OF CERTIFIED PUBLIC ACCOUNTANTS, INC., awards a scholarship in the amount of \$200 to a Maryland resident majoring in accounting.

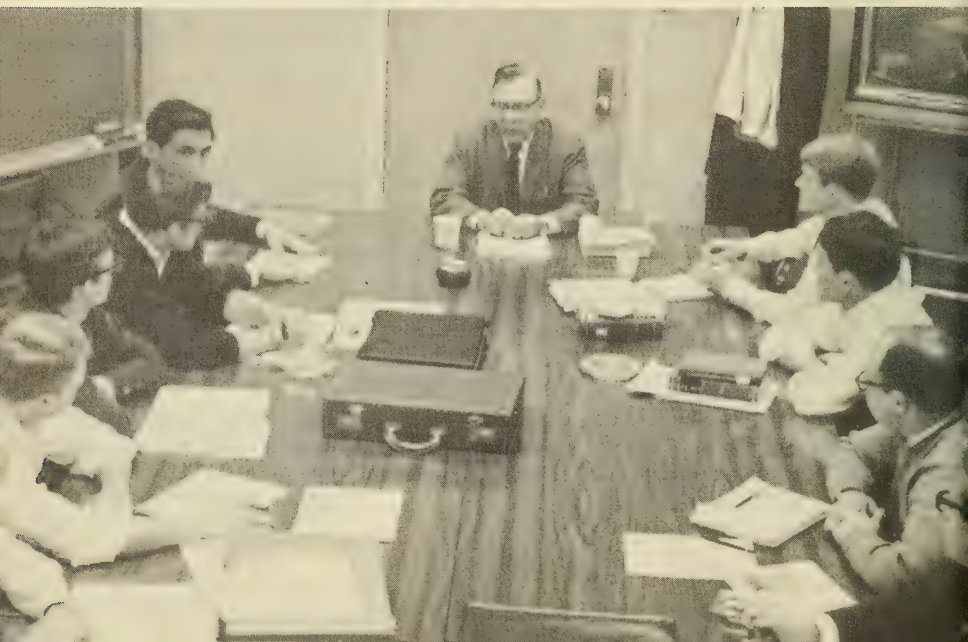
THE MINNEAPOLIS TRIBUNE scholarship in the amount of \$400.00 is awarded to a deserving student in journalism.

MOTOR FLEET SUPERVISORS INSTITUTE—A \$250 award is made to a member of the junior class majoring in Transportation with an interest in motor transportation who has shown in three years of training an apparent ability to succeed. This award is made through the College of Business and Public Administration.

THE MONTGOMERY COUNTY PRESS ASSOCIATION'S \$200 journalism scholarship is awarded to a student of that county.

PILOT FREIGHT CARRIERS, INC., Winston-Salem, North Carolina, provides a \$500 award to a senior in the College who is concentrating in Transportation with a major interest in motor transportation.

THE ARTHUR YOUNG AND CO. FOUNDATION, INC., makes available certain funds for awards for superior senior students concentrating in accounting who are registered in the College.



Required Courses and Course Offerings

I. BUSINESS ADMINISTRATION

Business organizations are set up primarily for the purpose of producing and distributing goods and services. Modern business administration requires a knowledge and understanding of organizational structures, operations and environments. The curricula of the Department of Business Administration emphasize the principles and problems involved in the development of organizations and in the formulation and implementation of their policies.

STUDY PROGRAMS IN THE DEPARTMENT

The programs of study in the Department of Business Administration are so arranged as to facilitate concentrations according to the major functions of business management. This plan is not, however, based on the view that these major divisions are independent units, but rather that each is closely related to and dependent on the others. Every student in Business Administration is required to complete satisfactorily a minimum number of required basic subjects in the arts, sciences, and humanities as prerequisites to work in the major management fields.

FRESHMAN AND SOPHOMORE REQUIREMENTS

ENGL 1, 3, and 4 (or 21, 3 and 4)	9 hours
MATH 10 and 11 (or 19 and 20)	6(8)
SPCH 1	3
History	6
BSAD 10	3
ECON 004 (students electing to take a foreign language may exempt this course)	3
BSAD 20 and 21	6
ECON 31 and 32	6

Two science courses (one biological and one physical, and at least one of which must be a lab science) selected from the following:

PHYSICAL	Astronomy	3	
	Geology	3	
	Physics	3	
	Chemistry	4	
BIOLOGICAL	Botany	4	
	Zoology	4	
	Microbiology	4	7-8

A social science course (ECON 031 may be used for 3 hours of the 6 hour social science requirement) selected from the following:

GVPT 1	3	
PSYC 1	3	
SOCY 1	3	
ANTH 1	3	3

A fine arts requirement of 3 hours of which the following are representative:

PHIL 1, 41, 45, 53	3
ART 10, 60, 61, 80	3
MUSC 20	3
SPCH 16	3

Electives (chosen with approval of adviser)	6-9 ¹
HLTH 5 (men and women)	1 sem. (2 cr.)
P. E. (men and women)	2 semesters

*Students who wish to elect a foreign language must take nine semester hours of the language or six hours at the intermediate level or higher, in order to obtain credit. Such students may substitute the first semester of foreign language for the ECON 004 requirement, and the other semesters for two free electives. Students planning to major in Statistics should take two semesters of calculus.

A TYPICAL PROGRAM FOR FIRST TWO YEARS FOR STUDENTS IN THE DEPARTMENT OF BUSINESS ADMINISTRATION:

<i>Freshman Year</i>			
ENGL 1 (or 21)	3	ENGL 3	3
BSAD 10 or Sp. 1	3	SPCH 1 or BSAD 10	3
MATH 10 (or 19)	3	MATH 11 (or 20)	3
ECON 004	3	HLTH 5	2
Fine Arts, Social Science, or Science ¹	3-4	Fine Arts, Social Science, or Science ¹	3-4
P.E.	1	P.E.	1
	<hr/>		<hr/>
	16-17		15-16
<i>Sophomore Year</i>			
ENGL 4	3	Elective	3
BSAD 20	3	BSAD 21	3
ECON 31	3	ECON 32	3
History	3	History	3
Fine Arts, Social Science, or Science ¹	3-4	Fine Arts, Social Science, or Science ¹	3-4
	<hr/>		<hr/>
	15-16		15-16

¹ Requirement is 3 hours of Fine Arts, 3 hours of Social Science, and 7 or 8 hours of Natural Science.

JUNIOR AND SENIOR REQUIREMENTS

During the junior and senior years each student is required to complete the following specified courses:

BSAD 130—Business Statistics I	3
BSAD 140—Business Finance	3
BSAD 149—Marketing Principles and Organization	3
BSAD 168—Management and Organization Theory	3
BSAD 180—Business Law	3
BSAD 199—Business Policies	3
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Total	18

In addition to the above, two 100 level courses must be taken in Economics, at least one of which must be: ECON 102, National Income Analysis; ECON 132, Intermediate Price Theory; ECON 140, Money and Banking; or ECON 148, International Economics.

At least 45 hours of the 120 semester hours of academic work required for graduation must be in Business Administration subjects. In addition to the requirement of an overall average of "C" in academic subjects, *an average of "C" in Business Administration subjects is required* for graduation. Electives in the curricula of the Department may, with the consent of the advisor, be taken in any department of the university if the student has the necessary prerequisites.

The General Curriculum in Business Administration

The General Curriculum in Business Administration is designed for those who desire a broad program in management. The curriculum contains a relatively large number of elective courses. Selection is subject to approval by an advisor and must contribute to a program of courses closely balanced between (1) a functional field, (2) the various basic areas of management and (3) non-business fields.

Students selecting this curriculum will take the basic courses required for all students in the Department of Business Administration. In addition, students will take:

(1) The following required courses:

BSAD 150—Marketing Management or BSAD 156 Marketing Research Methods	3 s.h.
BSAD 160—Personnel Management I or BSAD 163 Labor Relations	3 s.h.
BSAD 170—Principles of Transportation or BSAD 171—Traffic and Physical Distribution Management	3 s.h.
BSAD 101—Electronic Data Processing or BSAD 167 Operations Research I or BSAD 169 Production Management	3 s.h.
BSAD 189—Business and Government or BSAD 198 Structure and Operation of Industries	3 s.h.
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	15 s.h.

(2) three semester hours from the following:

BSAD 111—Intermediate Accounting (3)	
BSAD 131—Business Statistics II	
BSAD 148—Advanced Financial Management (3)	3 s.h.
BSAD 184—Public Utilities (3)	
Total	<hr/> 18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 s.h. required for graduation	18 s.h.
Total junior-senior year requirements	<hr/> 60 s.h.

ACCOUNTING

Accounting, in a limited sense, is the analysis, classification, and recording of financial events and the reporting of the results of such events for an organization. In a broader sense, accounting consists of all financial devices for planning, controlling and appraising performance of an organization. In this broader sense, accounting includes among its many facets financial planning, budgeting, accounting systems, financial management controls, financial analysis of performance, financial reporting, internal and external auditing and taxation of business.

The accounting curriculum provides an educational foundation for careers in accounting, and a foundation for future advancement in other management areas whether in private business organizations, government agencies, or public accounting firms. Students who select this curriculum will complete the freshman and sophomore requirements for all students in the Department of Business Administration.

Course requirements for the junior and senior years are:

- (1) the junior-senior requirements for all students in the Departments of Business Administration,
- (2) the following courses:

BSAD 101—Electronic Data Processing	3
BSAD 110, 111—Intermediate Accounting	6
BSAD 121—Cost Accounting	3
BSAD 123—Income Tax Accounting	3

and 9 semester hours from the following:

BSAD 122—Auditing Theory and Practice	3
BSAD 124—Advanced Accounting	3
BSAD 125—CPA Problems	3
BSAD 127—Advanced Auditing Theory and Practice	3
BSAD 128—Advanced Cost Accounting	2

Thus, the upper division requirements for accounting majors are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior accounting requirements (minimum)	21 s.h.
BSAD 101—Electronic Data Processing	3 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives (to complete 120 semester hours required for graduation)	12 s.h.
Total Junior-senior year requirements	60 s.h.

For graduates of the University of Maryland, the educational requirement of the Maryland State Board of Public Accountancy for taking the C.P.A. examination *without practical experience* totals thirty semester hours of accounting courses plus six semester hours of business law. Students wishing to satisfy the Board's requirements must include BSAD 122 in their undergraduate program. Students not wishing to satisfy the Board's requirements to sit for the C.P.A. examination without experience are eligible to take the examination after obtaining two years of practical experience satisfactory to the Board.

A student planning to take the C.P.A. examination in a State other than Maryland should determine the course requirements, if any, for such State, and arrange his program accordingly.

FINANCE

The curriculum in finance is designed to acquaint the student with financing methods and institutions and to familiarize him with the basic principles of financial analysis as used in managerial decision-making. Career destinations in the general area of finance include those in corporate financial management; investment management; the banking fields and insurance. Careers are also open in government service, for example, in regulatory agencies and international finance.

Students selecting this curriculum will take, in addition to the courses required for all students in the Department of Business Administration:

(1) The following required courses

BSAD 101—Electronic Data Processing	3 s.h.
BSAD 111—Intermediate Accounting	3 s.h.
BSAD 141—Security Analysis	3 s.h.
BSAD 143—Credit Management	3 s.h.
BSAD 148—Advanced Financial Management	3 s.h.
Total	15 s.h.

and

(2) three semester hours from the following:

ECON 142—Public Finance (3)	}	3 s.h.
ECON 147—Business Cycles (3)		
BSAD 167—Operations Research I (3)		
BSAD 184—Public Utilities (3)		
BSAD 195—Real Estate Principles (3)		
Total		18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 semester hours required for graduation	18 s.h.
Total Junior-senior year requirements	60 s.h.

INSURANCE AND REAL ESTATE

Students interested in insurance or real estate may concentrate either in General Business or Finance and plan with their advisers a group of electives to meet their specialized needs. Courses offered in insurance and real estate include risk management, principles of risk and insurance, real estate principles, and urban land management.

MARKETING

Marketing involves the functions performed in getting goods and services from producers to users. Career opportunities exist in manufacturing, wholesaling and retailing and include sales administration, marketing research, advertising and merchandising.

Students preparing for work in marketing research are advised to elect additional courses in Statistics.

In addition to the courses taken by all students in the Department of Business Administration, the marketing program consists of:

(1) the following required courses:

BSAD 150—Marketing Management	3 s.h.
BSAD 151—Advertising	3 s.h.
BSAD 154—Retail Management	3 s.h.
BSAD 156—Marketing Research Methods	3 s.h.
Total required	12 s.h.

and

(2) six semester hours from the following:

BSAD 101—Electronic Data Processing (3)	}	6 s.h.
BSAD 132—Sample Surveys in Business and Economics (3)		
BSAD 143—Credit Management (3)		
JOUR 152—Advertising Copy and Layout (3)		
BSAD 153—Purchasing Management (3)		
BSAD 157—International Marketing (3)		
BSAD 158—Advertising Management (3)		
BSAD 167—Operations Research I (3)		
BSAD 171—Traffic and Physical Distribution Management (3)		
Total		18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 158	6 s.h.
Electives to complete 120 semester hours required for graduation	18 s.h.
Total, Junior-senior year requirements	60 s.h.

PERSONNEL AND LABOR RELATIONS

Personnel administration has to do with the direction of human effort. It is concerned with securing, maintaining, and utilizing an effective working force. People professionally trained in personnel administration find career opportunities in business, in government, in educational institutions, and in charitable and other organizations.

(1) The required courses are:

BSAD 160—Personnel Management I	3 s.h.
BSAD 161—Personnel Management II	3 s.h.
BSAD 163—Labor Relations	3 s.h.
BSAD 164—Labor Legislation	3 s.h.
Total required	12 s.h.

and

(2) six hours from the following:

BSAD 131—Business Statistics II (3)	}	6 s.h.
BSAD 132—Sample Surveys in Business and Economics (3)		
BSAD 167—Operations Research I (3)		
BSAD 169—Production Management (3)		
BSAD 189—Business and Government (3)		
Total		18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 semester hours required for graduation	18 s.h.
Total, Junior-senior year requirements	60 s.h.

PRODUCTION MANAGEMENT

This curriculum is designed to acquaint the student with the problems of organization and control in the field of production management. Theory and practice with reference to organization, policies, methods, processes and techniques are surveyed, analyzed, and evaluated.

The courses in addition to those required of all students in the Department of Business Administration are:

(1) The following required courses:

BSAD 121—Cost Accounting	3 s.h.
BSAD 160—Personnel Management I	3 s.h.
BSAD 169—Production Management	3 s.h.
BSAD 165—Advanced Production Management	3 s.h.
Total required	12 s.h.

and

(2) six hours from the following:

BSAD 134—Statistical Quality Control (3)	}	6 s.h.
BSAD 153—Purchasing Management (3)		
BSAD 163—Labor Relations (3)		
BSAD 167—Operations Research I (3)		
BSAD 171—Traffic and Physical Distribution Management (3)		
Total		18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 semester hours required for graduation	18 s.h.
Total Junior-senior year requirements	60 s.h.

STATISTICS

Statistics consists of a body of methods for utilizing probability theory in decision-making processes. Important statistical activities ancillary to the decision-making process are the systematization of quantitative data and the measurement of variability. Some specialized areas within the field of statistics are: sample surveys, forecasting, quality control, design of experiments, Bayesian decision processes, actuarial statistics, and data processing. Statistical methods—for example, sample survey techniques—are widely used in accounting, marketing, industrial management and government applications.

An aptitude for applied mathematics and a desire to understand and apply scientific methods to significant problems are important prerequisites for the would-be statistician.

Students planning to major in statistics should take two semesters of calculus.

Students selecting this curriculum will take, in addition to the courses required for all students in the Department of Business Administration:

(1) the following required courses:

BSAD 101—Electronic Data Processing	3 s.h.
BSAD 131—Business Statistics II	3 s.h.
BSAD 132—Sample Surveys in Business and Economics	3 s.h.
BSAD 135—Statistical Analysis and Forecasting	3 s.h.
and	12 s.h.

(2) six semester hours from the following:

BSAD 102—Electronic Data Processing Applications (3)	} 6 s.h.
BSAD 134—Statistical Quality Control (3)	
BSAD 156—Marketing Research Methods (3)	
BSAD 167—Operations Research I (3)	
STAT 50—Introduction to Random Variables (3)*	
STAT 100—Probability and Statistics I (3)*	
Total	18 s.h.

*Students majoring in statistics may not take Stat. 50 and Stat. 100 in fulfillment of their special requirements. Only one of these courses can be counted toward the necessary 18 credit hours.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 s.h. required for graduation	18 s.h.
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Total junior-senior requirement	60 s.h.

TRANSPORTATION

Transportation involves the movement of persons and goods in the satisfaction of human needs. The curriculum in transportation includes an analysis of the services and management problems, such as pricing, financing, and organization, of the five modes of transport—air, motor, pipelines, railroads, and water—and covers the scope and regulation of transportation in our economy. The effective management of transportation involves a study of the components of physical distribution and the interaction of procurement, the level and control of inventories, warehousing, material handling, transportation, and data processing.

The curriculum in transportation is designed to prepare students to assume responsible positions with carriers, governmental agencies, and traffic and physical distribution management in industry.

Course requirements are, in addition to the junior-senior requirements for all students in the Department of Business Administration:

(1) the required following courses:

BSAD 167—Operations Research I	3 s.h.
BSAD 170—Principles of Transportation	3 s.h.
BSAD 171—Traffic and Physical Distribution Management	3 s.h.
BSAD 172—Motor Transportation	3 s.h.
BSAD 175—Advanced Transportation Problems	3 s.h.
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Total	15 s.h.

and

(2) three semester hours to be selected from the following:

BSAD 173—Water Transportation	}	. 3 s.h.
BSAD 174—Commercial Air Transportation (3)		
BSAD 176—Urban Transport and Urban Development (3)		
BSAD 184—Public Utilities (3)		
BSAD 192—Introduction to International Business Management (3)		
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Total required		18 s.h.

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	18 s.h.
Junior-senior curriculum concentration	18 s.h.
Electives in 100 level economics courses at least one of which must be ECON 102, 132, 140, or 148	6 s.h.
Electives to complete 120 s.h. required for graduation	18 s.h.
Total junior-senior year requirements	<hr/> 60 s.h.

COMBINED BUSINESS ADMINISTRATION AND LAW PROGRAM

The Department of Business Administration offers a combined Business Administration-Law Curriculum in which the student completes three years in the General Curriculum in Business Administration in the department and a fourth year of work in the Law School of the University of Maryland. Admission to the Law School is contingent upon meeting the applicable standards of that school. Individual students are responsible to secure from the Law School its current admission requirements. The student must complete all the courses required of students in the Department plus the courses normally required for the General Curriculum in Business Administration through the junior year, plus enough electives to equal a minimum of 90 semester hours; an average grade of "C" or better must be earned. No business law course can be included in the 90 hours. The last year of college work before entering the Law School must be completed in residence at College Park. At least 30 hours of work must be in courses numbered 100 or above.

The Bachelor of Science degree from the College of Business and Public Administration is conferred upon students who complete the first year in the Law School with an average grade of "C" or better.

MASTER OF BUSINESS ADMINISTRATION

Candidates for the degree of Master of Business Administration and Doctor of Business Administration are accepted in accordance with the procedures and requirements for the Graduate School. (See the Graduate School Announcements.)

BUSINESS ADMINISTRATION

Professors: TAFF, CLEMENS, COOK, DAWSON, FISHER, GENTRY, AND WRIGHT

Associate Professors: ANDERSON, ASHMEN, CARROLL, HERMANSON, LEVINE, NASH, OLSON, PAINE, RYANS, AND SPIVEY

Assistant Professors: BAKER, BRABHAM, CLICKNER, DAIKER, EDELSON, FALTH-
ZIK, HILLE, HIMES, LAMONE, McNITT, SUELFLOW, AND WIMS

Instructors: BEDINGFIELD, BROWN, DONNELLY, ENGLISH, FREY, GIBBONS, HISE, HORLICK, IVANCEVICH, KMETZ, LEETE, MATTHEISS, McCAUL, MEYER, MUCZYK, NEFFINGER, PISANI, ROSEN, ROY, SMITH, STRAWSER, AND VAN DANIKER

BSAD 10. BUSINESS ENTERPRISE. (3)

A survey course covering the internal and functional organization of a business enterprise, its organization and control.

BSAD 20, 21. PRINCIPLES OF ACCOUNTING. (3, 3)

Prerequisite, sophomore standing. The principles of accounting for business enterprise and the use of accounting data in making business decisions.

For Graduates and Advanced Undergraduates

BSAD 100. OFFICE OPERATIONS AND MANAGEMENT. (3)

Deals with the principles of scientific management as they apply to the examination, improvement, installation, and operation of the most effective paperwork methods and systems that a given organization can use to achieve its objectives. Procedure flow analysis and form design for control of paperwork; process, work distribution, and layout charts, distribution of authority and responsibility for office activities are among the areas considered.

BSAD 101. ELECTRONIC DATA PROCESSING. (3)

Students enrolled in the Department of Business Administration curricula will register for ISM 101. For detailed information on prerequisites and description of the course, refer to ISM 101. The credits earned in ISM 101 may be included in the total credits earned in the area of concentration in business administration.

BSAD 102. ELECTRONIC DATA PROCESSING APPLICATIONS. (3)

Students enrolled in the Department of Business Administration curricula will register for ISM 102. For detailed information on prerequisites and description of the course, refer to ISM 102. The credits earned in ISM 102 may be included in the total credits earned in the area of concentration in business administration.

BSAD 103. INTRODUCTION TO SYSTEMS ANALYSIS. (3)

Students enrolled in the Department of Business Administration curricula will register for ISM 103. For detailed information on prerequisites and description of the course, refer to ISM 103. The credits earned in ISM 103 may be included in the total credits earned in the area of concentration in business administration.

BSAD 110, 111. INTERMEDIATE ACCOUNTING. (3, 3)

Prerequisite, BSAD 21. A comprehensive study of the theory and problems of valuation of assets, application of funds, corporation accounts and statements, and the interpretation of accounting statements.

BSAD 118, 119. UNDERGRADUATE ACCOUNTING SEMINAR. (3, 3)

Prerequisite, senior standing as an accounting major or consent of instructor. Enrollment limited to upper one-third of senior class. Seminar coverage of outstanding current non-text literature, current problems and case studies in accounting.

BSAD 120. ACCOUNTING SYSTEMS. (3)

Prerequisite, BSAD 20. A study of the factors involved in the design and installation of accounting systems: the organization, volume and types of transactions, charts of accounts, accounting manuals, the reporting system.

BSAD 121. COST ACCOUNTING. (3)

Prerequisite, BSAD 21. A study of the basic concepts of product costing and cost analysis for management planning and control. Emphasis is placed on the role of the account in organizational management, analysis of cost behavior, standard costs, budgeting, responsibility accounting and relevant costs for decision making.

BSAD 122. AUDITING THEORY AND PRACTICE. (3)

Prerequisite, BSAD 111. A study of the principles and problems of auditing and application of accounting principles to the preparation of audit working papers and reports.

BSAD 123. INCOME TAX ACCOUNTING. (3)

Prerequisite, BSAD 21. A study of the important provisions of the Federal Tax Laws, using illustrative examples, selected questions and problems, and the preparation of returns.

BSAD 124. ADVANCED ACCOUNTING. (3)

Prerequisite, BSAD 111. Advanced Accounting theory applied to specialized problems in partnerships, ventures, consignments, installment sales, insurance, statement of affairs, receiver's accounts, realization and liquidation reports, and consolidation of parent and subsidiary accounts.

BSAD 125. C.P.A. PROBLEMS. (3)

Prerequisite, BSAD 111, or consent of instructor. A study of the nature, form and content of C.P.A. examinations by means of the preparation of solutions to, and an analysis of, a large sample of C.P.A. problems covering the various accounting fields.

BSAD 127. ADVANCED AUDITING THEORY AND PRACTICE. (3)

Prerequisite, BSAD 122. Advanced auditing theory and practice and report writing.

BSAD 128. ADVANCED COST ACCOUNTING. (2)

Prerequisite BSAD 121. A continuation of basic cost accounting with special emphasis on process costs, standard costs, joint costs and by-product costs.

BSAD 129. APPRENTICESHIP IN ACCOUNTING. (0)

Prerequisites, minimum of 20 semester hours in accounting and the consent of the accounting staff. A period of apprenticeship is provided with nationally known firms of certified public accountants from about January 15 to February 15, and for a semester after graduation.

BSAD 130. BUSINESS STATISTICS I. (3)

An introductory course discussing basic statistical concepts and various widely used statistical techniques, namely: ratios and percentages; the tabular and graphic presentation of statistical data; frequency distributions; measures of

central tendency, variability, skewness and kurtosis; the binomial and normal probability distributions; tests of hypotheses concerning means and proportions; the estimation of means and proportions; two-variable linear correlation analysis.

BSAD 131. BUSINESS STATISTICS II. (3)

Prerequisite, BSAD 130 or equivalent. A course complementing BSAD 130. The topics covered include: trend analysis in its simpler aspects; seasonal and cycle analysis; nonlinear two-variable correlation analysis; correlation analysis of grouped data; some reference to multiple correlation analysis; the chi-square test; analysis of variance; index numbers.

BSAD 132. SAMPLE SURVEYS IN BUSINESS AND ECONOMICS. (3)

Prerequisite, BSAD 130 or equivalent. A course surveying the uses of statistics in economic and business research. The emphasis of the discussion is directed toward "cross-section" analysis as distinct from "time-series" analysis (which is given detailed attention in BSAD 135). Topics covered include: research methodology, sampling techniques and design, data-collection methods, questionnaire preparation, interviewing procedures, the evaluation of survey results, and a review of selected case studies.

BSAD 134. STATISTICAL QUALITY CONTROL. (3)

Prerequisite, BSAD 130, or equivalent. A course surveying the uses of statistical principles in industry. Topics considered include: A brief review of basic statistical measures: a study of the hypergeometric, binomial, normal, and Poisson probability distributions; the sampling distributions of the mean, the standard deviation, and the range; the construction and operation of the various control charts in current use; the diagnostic significance of different findings; acceptance sampling on the basis of measurement data and on the basis of attribute data.

BSAD 135. STATISTICAL ANALYSIS AND FORECASTING. (3)

Prerequisite, BSAD 130 or equivalent. A course exploring the usefulness of statistical methods in economic prediction. Various forecasting techniques in current use are examined. Major topics receiving attention are the analysis of trends, the identification of seasonal patterns and cycles, and the measurement of economic relationships. The discussion goes beyond the points made in BSAD 131. Particularly the uses of multiple correlation analysis are examined in great detail. Some reference is also made to the predictive potentialities of so-called anticipations statistics. Throughout the course, due attention is given to the logical aspects of the forecasting problem as distinct from its statistical side.

BSAD 140. BUSINESS FINANCE. (3)

Prerequisite, BSAD 21. This course deals with principles and practices involved in the organization, financing, and rehabilitation of business enterprises; the various types of securities and their use in raising funds, apportioning income, risk, and control; intercorporate relations; and new developments. Emphasis on solution of problems of financial policy faced by management.

BSAD 141. SECURITY ANALYSIS. (3)

Prerequisite, BSAD 140. A study of the principles and methods used in the analysis, selection, and management of investments, investment programs, sources of investment information, security price movements, government, real estate, public utility, railroad and industrial securities.

BSAD 143. CREDIT MANAGEMENT. (3)

Prerequisite, BSAD 140. A study of the nature of credit and the principles applicable to its extension and redemption for mercantile and consumer pur-

poses; sources of credit information and analysis of credit reports; the organization and management of a credit department for effective control. Recent developments and effective legal remedies available.

BSAD 148. ADVANCED FINANCIAL MANAGEMENT. (3)

Prerequisite, BSAD 140. An advanced course in finance. Emphasis is placed upon the techniques employed by executives in their application of financial management practice to selected problems and cases. Critical classroom analysis is brought to bear upon actual methods and techniques used by business enterprises.

BSAD 149. MARKETING PRINCIPLES AND ORGANIZATION. (3)

Prerequisite, ECON 32 or 37. This is an introductory course in the field of marketing. Its purpose is to give a general understanding and appreciation of the forces operating, institutions employed, and methods followed in marketing agricultural products, natural products, services, and manufactured goods.

BSAD 150. MARKETING MANAGEMENT. (3)

Prerequisite, BSAD 149. A study of the work of the marketing division in a going organization. The work of developing organizations and procedures for the control of marketing activities is surveyed. The emphasis throughout the course is placed on the determination of policies, methods, and practices for the effective marketing of various forms of manufactured products.

BSAD 151. ADVERTISING. (3)

Prerequisite, BSAD 149. A study of the role of advertising in the American economy; the impact of advertising on our economic and social life, the methods and techniques currently applied by advertising practitioners, the role of the newspaper, magazine, and other media in the development of an advertising campaign, modern research methods to improve the effectiveness of advertising, and the organization of the advertising business.

BSAD 153. PURCHASING MANAGEMENT. (3)

Prerequisite, BSAD 149. Determining the proper sources, quality and quantity of supplies, and methods of testing quality; price policies, price forecasting, forward buying, bidding and negotiation; budgets and standards of achievement. Attention is given to government purchasing and methods and procedures used in government procurement.

BSAD 154. RETAIL MANAGEMENT. (3)

Prerequisite, BSAD 20 and 149. Retail store organization, location, layout and store policy; pricing policies, price lines, brands, credit policies, records as a guide to buying; purchasing methods; supervision of selling; training and supervision of retail sales force; and administrative problems.

BSAD 156. MARKETING RESEARCH METHODS. (3)

Prerequisites, BSAD 130 and BSAD 149. This course is intended to develop skill in the use of scientific methods in the acquisition, analysis and interpretation of marketing data. It covers the specialized fields of marketing research, the planning of survey projects, sample design, tabulation procedure and report preparation.

BSAD 157. INTERNATIONAL MARKETING. (3)

Prerequisites BSAD 149 and BSAD 192. A study of the marketing functions from the viewpoint of the international executive. In addition to the coverage of international marketing policies relating to product adaptation, data collection and analysis, channels of distribution, pricing, communications, and cost analysis, con-

sideration is given to the cultural, legal, financial, and organizational aspects of international marketing.

BSAD 158. ADVERTISING MANAGEMENT. (3)

Prerequisite, BSAD 149. This course is concerned with the way in which business firms use advertising as a part of their marketing program. The case study method is used to present advertising problems taken from actual business practice. Cases studied illustrate problems in demand stimulation, media selection, advertising research, testing, and statistical control of advertising.

BSAD 160. PERSONNEL MANAGEMENT I. (3)

This course deals with the problems of directing and supervising employees under modern industrial conditions. Two phases of personal administration are stressed, the application of scientific management and the importance of human relations in this field.

BSAD 161. PERSONNEL MANAGEMENT II. (3)

Prerequisite, BSAD 160. Job evaluation and merit rating and other personnel management techniques generally employed in business.

BSAD 163. LABOR RELATIONS. (3)

A study of the development and methods of organized groups in industry with reference to the settlement of labor disputes. An economic and legal analysis of labor union and employer association activities, arbitration, mediation, and conciliation; collective bargaining, trade agreements, strikes, boycotts, lockouts, company unions, employee representation, and injunctions.

BSAD 164. LABOR LEGISLATION. (3)

Case method analysis of the modern law of industrial relations. Cases include the decisions of administrative agencies, courts and arbitration tribunals.

BSAD 165. ADVANCED PRODUCTION MANAGEMENT. (3)

Prerequisite, BSAD 169. A study of typical problems encountered by the factory manager. The objective is to develop the ability to analyze and solve problems in management control of production and in the formulation of production policies. Among the topics covered are plant location, production planning and control, methods analysis and time study.

BSAD 166. BUSINESS COMMUNICATIONS. (3)

A systematic study of the principles of effective written communications in business. The fundamental aim is to develop the ability to write clear, correct, concise, and persuasive business letters and reports.

BSAD 167. OPERATIONS RESEARCH I. (3)

Prerequisite, BSAD 130 or consent of instructor. The philosophy, methods and objectives of operations research. Basic methods are examined and their application to functional areas of business are covered. (This course is also listed as ISM 167 and may be taken for Information Systems Management credit.)

BSAD 168. MANAGEMENT AND ORGANIZATION THEORY. (3)

The development of management and organization theory, nature of the management process and function and its future development. The role of the manager as an organizer and director, the communication process, goals and responsibilities.

BSAD 169. PRODUCTION MANAGEMENT. (3)

Studies the operation of a manufacturing enterprise, concentrating on the economies of production. Introduces a grounding in analytical method early so that the broad problem areas of system design, operation, and control can be based upon the analytical method.

BSAD 170. PRINCIPLES OF TRANSPORTATION. (3)

Prerequisite, ECON 32 or 37. A general course covering the five fields of transportation, their development, service and regulation.

BSAD 171. TRAFFIC AND PHYSICAL DISTRIBUTION MANAGEMENT. (3)

Prerequisite, junior standing. Examines the management aspects of the business firm in moving their raw materials and finished goods, through traffic, warehousing, industrial packaging, materials handling, and inventory. A systematic examination of the trade-off possibilities and management alternatives to minimize cost of product flow and maximizing customer service is provided.

BSAD 172. MOTOR TRANSPORTATION. (3)

Prerequisite, BSAD 170. The development and scope of the motor carrier industry, different types of carriers, economics of motor transportation, services available, federal regulation, highway financing, allocation of cost to highway users, highway barriers.

BSAD 173. WATER TRANSPORTATION. (3)

Prerequisite, BSAD 170. Water carriers of all types, development and types of services, trade routes, inland waterways, company organization, the American Merchant Marine as a factor in national activity.

BSAD 174. COMMERCIAL AIR TRANSPORTATION. (3)

Prerequisite, BSAD 170. The air transportation system of the United States; airways, airports, airlines. Federal regulation of air transportation. Problems and services of commercial air transportation; economics, equipment, operations, financing, selling of passenger and cargo services. Air mail development and services.

BSAD 175. ADVANCED TRANSPORTATION PROBLEMS. (3)

Prerequisite, BSAD 170. A critical examination of current government transportation policy and proposed solutions. Urban and intercity managerial transport problems are also considered.

BSAD 176. URBAN TRANSPORT AND URBAN DEVELOPMENT. (3)

Prerequisite, ECON 32 or 37. An analysis of the role of urban transportation in present and future urban development. The interaction of transport pricing and service, urban planning, institutional restraints, and public land uses, is studied.

BSAD 180. BUSINESS LAW. (3)

Legal aspects of business relationships, contracts, negotiable instruments, agency, partnerships, corporations, real and personal property, and sales.

BSAD 181. BUSINESS LAW. (3)

Legal aspects of business relationships, contracts, negotiable instruments, agency, partnerships, corporations, real and personal property, and sales.

BSAD 182. LEGAL ENVIRONMENT OF BUSINESS. (3)

The course examines the principal ideas and men in law stressing those which are relevant for the modern business executive. Legal reasoning as it has evolved in this country will be one of the central topics of study. Several leading antitrust cases will be studied to illustrate vividly the reasoning process as well as the interplay of business, philosophy, and the various conceptions of the nature of law which give direction to the process. Examination of contemporary legal problems and proposed solutions, especially those most likely to affect the business community, are also covered.

BSAD 184. PUBLIC UTILITIES. (3)

Prerequisites, ECON 32 or 37. Using the regulated industries as specific examples attention is focused on broad and general problems in such diverse fields as constitutional law, administrative law, public administration, government control of business, advanced economic theory, accounting, valuation and depreciation, taxation, finance, engineering and management.

BSAD 189. BUSINESS AND GOVERNMENT. (3)

Prerequisites, ECON 32 or 37. A study of the role of government in modern economic life. Social control of business as a remedy for the abuses of business enterprise arising from the decline of competition. Criteria of limitations on government regulation of private enterprise.

BSAD 190. RISK MANAGEMENT. (3)

Designed to acquaint the student with the nature and significance of risk in business enterprise. The problems relating to both pure and speculative risk in business are considered; and methods of solution involving risk assumption, transfer, reduction, and the use of insurance are analyzed as aids in management decision making.

BSAD 191. PRINCIPLES OF RISK AND INSURANCE. (3)

Emphasizes the use of insurance in resolving problems involving personal and business risks. Life, accident and health, fire and casualty, automobile, and marine insurance are examined as means of dealing with these risks. The theory and legal aspects of insurance are considered, as well as the quantitative measurement of risks.

BSAD 192. INTRODUCTION TO INTERNATIONAL BUSINESS MANAGEMENT. (3)

A study of the domestic and foreign environmental factors affecting the international operations of U.S. business firms. The course also covers the administrative aspects of international marketing, finance, and management.

BSAD 195. REAL ESTATE PRINCIPLES. (3)

Prerequisite, ECON 32 or 37. This course covers the nature and uses of real estate, real estate as a business, basic legal principles, construction problems and home ownership, city planning, and public control and ownership of real estate.

BSAD 196. URBAN LAND MANAGEMENT. (3)

Covers the managerial and decision making aspects of urban land and property. Included are such subjects as land use and valuation matters.

BSAD 198. STRUCTURE AND OPERATIONS OF INDUSTRIES. (3)

Prerequisite, senior standing. The impact of technology and production policies on the economic, financial, marketing, and locational policies of representative industries. A background course for students in industrial and financial management, business economics, general business, and related areas.

BSAD 199. BUSINESS POLICIES. (3)

Prerequisite, BSAD 140, 149, 168 and senior standing. A case study course in which the aim is to have the student apply both what he has learned of general management principles and their specialized functional applications of the overall management function in the enterprise.

*For Graduates***BSAD 210. ADVANCED ACCOUNTING THEORY I. (3)**

The study of the theoretical and conceptual foundations for generally accepted accounting principles and practices. Recent and current literature and ideas are

studied in depth to provide coverage of the basic postulates, assumptions, and standards which underlie the measurement criteria and practices of financial accounting.

BSAD 211. ADVANCED ACCOUNTING THEORY II. (3)

Prerequisite, BSAD 210. A study of the more controversial, not generally accepted ideas and concepts, currently proposed as suggested solutions to current problems or to improve the state of the art of financial accounting measurements.

BSAD 212. ACCOUNTING IN REGULATED INDUSTRIES. (3)

A study of the unique accounting problems of industries subject to cost and price regulations of government agencies. Included are government contracts and grants, rate regulations for transportation carriers and public utilities, distribution cost analyses under the Robinson-Patman Act, and cost regulations of the Medicare program.

BSAD 213. THE IMPACT OF TAXATION ON BUSINESS DECISIONS. (3)

A study of the impact of tax law and regulations on alternative business strategies. Particular emphasis is given to the large, multidivisional firm. Problems of acquisitions, mergers, spinoffs, and other divestitures are considered from the viewpoint of profit planning, cash flow, and tax deferment.

BSAD 214. CURRENT PROBLEMS OF PROFESSIONAL PRACTICE. (3)

A study of the current problems of the C.P.A. in the practice of the professional accountant: Generally accepted auditing standards, auditing practices, legal and ethical responsibilities, and the accounting and reporting requirements of the Securities and Exchange Commission.

BSAD 220. MANAGERIAL ACCOUNTING I. (3)

BSAD 220 or BSAD 240 is required of M.B.A. candidates. The use of accounting data for corporate financial planning and control. Topics included are organization for control, profit planning, budgeting, relevant costing, return on investment, and administration of the controllership function in smaller organizations.

BSAD 221. MANAGERIAL ACCOUNTING II. (3)

Prerequisite, BSAD 220. The management of the controllership function in the large, multidivisional firm. Centralized and decentralized organizations; management control systems in consolidated and conglomerate corporations; alternative strategies for profit maximization; acquisitions and divestitures for increased investment return.

BSAD 230. STATISTICAL ANALYSIS AND BUSINESS DECISIONS. (3)

This course acquaints students with the "Bayesian" approach to decision-making. Topics dealt with include: A review of basic probability concepts and theorems; the relationship between expected utility and rational action; incremental analysis; partial expectations; linear profits and costs; opportunity loss and the cost of uncertainty; conditional and joint probability; the binomial, Pascal, Poisson, Gamma, and normal probability distributions; the revision of probabilities in the light of new information; preposterior analysis and sequential decision procedures.

BSAD 231. THEORY OF SURVEY DESIGN. (3)

A course examining the usefulness of statistical principles in survey design. The discussion covers such topics as the nature of statistical estimation, the differential attributes of different estimators, the merits and weaknesses of

available sampling methods and designs. Detailed attention is given to the distinctive aspects of simple random samples, stratified random samples, and cluster samples. Some time is spent on a consideration of ratio estimates and the problems posed by biases and nonsampling errors.

BSAD 234. MANAGERIAL ANALYSIS I. (3)

Required of M.B.A. candidates. The processes, tools, and evaluation of quantitative analysis for management. Emphasizes tools and methodological problems in applying management science to aid managerial decision-making. Deals with the relationship of other quantitative aids to managerial actions such as economic analysis and systems analysis. Where feasible the computer's role in management analysis will be emphasized and demonstrated.

BSAD 235. MANAGEMENT SCIENCE—DETERMINISTIC MODELS. (3)

Prerequisite, Mathematics, thru differential calculus, and BSAD 234 or consent of instructor. The theory and use of deterministic models in management science. Models are based upon optimization techniques for conditions of data certainty. Includes linear programming models, inventory models, and replacement models.

BSAD 236. MANAGEMENT SCIENCE—PROBABILISTIC MODELS. (3)

Prerequisite, consent of instructor. The theory and use of probabilistic models in management science. Models are based upon conditions of data uncertainty. Includes queuing models, network models, game theoretic models involving Markov processes.

BSAD 237. MANAGEMENT SIMULATION. (3)

Prerequisite, BSAD 234 or consent of instructor. Deals with the development, manipulation, and validity of an operational model. Production information and other decision systems of concern to management will be studied. Manipulation of parameter values, assumptions, and conditions. This is accomplished in conjunction with the use of computer facilities at the Computer Science Center on campus.

BSAD 238. OPTIMIZATION METHODS FOR MANAGERIAL ANALYSIS. (3)

Prerequisite, a course dealing with the theory and application of linear programming such as BSAD 235, ECON 214, or permission of instructor. The theory and use of optimization methods for managerial analysis. Review of simplex algorithm. Covers transportation algorithms, dynamic programming and where feasible quadratic programming, parametric programming and other appropriate optimization techniques.

BSAD 240. FINANCIAL ADMINISTRATION. (3)

BSAD 240 or BSAD 220 is required of M.B.A. candidates. The role of the financial manager in executive decision making. Financial planning, analysis, and control in such areas as the allocation of financial resources within the firm, forecasting and budgeting, capital budgeting and the bases for investment decisions, alternative sources of short-term and long-term financing and financial problems of growth.

BSAD 241. WORKING CAPITAL MANAGEMENT. (3)

An intensive study of short- and intermediate-term sources of funds and the management of cash, accounts receivable and inventories. Includes consideration of determinants of working capital needs, financial analysis as related to short-term financing problems, estimation of funds requirements, patterns of fund requirements, and major types of loan arrangements. Case studies, supplemented with outside readings.

BSAD 242. LONG-TERM CAPITAL MANAGEMENT. (3)

An intensive study of long-term financing, return on investment and cost of capital. Particular attention is paid to appraising alternative forms of long-term financing, methods of measuring return on investment, and problems such as measuring the cost of capital of cyclical companies and growth companies. Case studies, supplemented with outside readings.

BSAD 243. INVESTMENT ANALYSIS. (3)

Evaluation of debt and equity security alternatives available for the employment of the investment fund. Analysis of economic and financial data of the national economy, the industry, and the company to arrive at the fundamental value of a security. Study of securities markets as independent regulators of investment values. Motives, needs, and basic ingredients in the selection and supervision of the portfolio.

BSAD 244. PORTFOLIO MANAGEMENT. (3)

Prerequisite, BSAD 243 or consent of instructor. The process of investment. Selection and supervision of securities appropriate for the requirements and objectives of both the individual and institutional investor. Underlying considerations necessary for the continued success of the investment program. Critical analysis of case studies in portfolio management. Effects of temporary changes on investment decisions.

BSAD 245. FINANCIAL INSTITUTIONS. (3)

Provides an analysis of the structure of financial institutions in the American economy, including commercial banking and non-banking organizations which serve business and consumers. Topics covered include determinants of the demand for, and supply of, funds and the role of financial institutions in channeling financial capital among the various sectors of the American economy.

BSAD 247. INTERNATIONAL FINANCIAL ADMINISTRATION. (3)

Deals with the problems of financial administration of the multinational firm. Includes the financing of investment abroad and management of assets in differing financial environments as well as the financing of exports and imports. Also includes consideration of national and international financial institutions as they relate to the international operations of American and foreign business firms.

BSAD 250. MARKETING ADMINISTRATION. (3)

Required for M.B.A. candidates with concentrations in Marketing. Principal objectives of the course are: to develop an understanding of the problems and goals of marketing executives, to develop competence in the analysis and solution of marketing problems, and to evaluate specific marketing efforts as they contribute to a coordinated total marketing program. Attention will be focused on product, price, and service policies, market characteristics, channel selection, promotional policies and organization structure.

BSAD 251. MARKETING COMMUNICATIONS MANAGEMENT. (3)

Required for M.B.A. candidates concentrating in Marketing. This course is concerned with the part that advertising, promotion, public relations and related efforts play in the accomplishment of a firm's total marketing objectives. Its purpose is to develop competence in the formulation of mass communications objectives in budget optimization, media appraisal, theme selection, program implementation and management, and results measurement.

BSAD 252. MARKETING RESEARCH METHODS. (3)

Required for M.B.A. candidates concentrating in Marketing. The course deals with the process of acquiring, classifying, and interpreting primary and second-

ray marketing data needed for intelligent, profitable marketing decisions. Through readings, discussions, and case studies, efforts are made to develop skill in evaluating the appropriateness of alternative methodologies such as the inductive, deductive, survey, observational, and experimental. Consideration is also given to recent developments in the systematic recording and use of internal and external data needed for marketing decisions.

BSAD 254. MARKETING CHANNELS ANALYSIS. (3)

A course that focuses on the fundamentals explaining alternate channels of distribution and the roles played by various intermediaries, the evolution of business structures in marketing, reasons for change, and projected marketing patterns for the future. M.B.A. candidates may register with permission of instructor.

BSAD 256. QUANTITATIVE METHODS IN MARKETING: DEMAND AND COST ANALYSIS. (3)

Consideration is given to quantitative methods in the analysis and prediction of market demand and marketing costs. Topics in connection with demand include market potentials, sales forecasting, consumer analysis, promotional and pricing results, and the like. Cost analysis focuses on allocation of costs by marketing functions, products, territories, customers and marketing personnel. Statistical techniques, mathematics, models and other methods are utilized in the solution of marketing problems. M.B.A. candidates may register with permission of instructor.

BSAD 257. THEORY IN MARKETING. (3)

An inquiry into the problems and elements of theory development in general with specific references to the field of Marketing. A critical analysis and evaluation of past and contemporary efforts to formulate theories of marketing and to integrate theories from the social sciences into a marketing framework. Attention is given to the development of concepts in all areas of marketing thought and to their potential application in the business firm.

BSAD 258. INTERNATIONAL MARKETING. (3)

Deals with environmental, organizational, and financial aspects of international marketing as well as problems of marketing research, pricing, channels of distribution, product policy, and communications which face U. S. firms trading with foreign firms or which face foreign firms in their operations.

BSAD 260. MANAGEMENT PLANNING AND CONTROL SYSTEMS. (3)

Concerned with planning and control systems for the fulfillment of organizational objectives. Identification of organizational objectives, responsibility centers, information needs and information network. Case studies of integrated planning and control systems.

BSAD 261. COLLECTIVE BARGAINING—CURRENT PROBLEMS AND ISSUES. (3)

Examines contemporary problems and issues associated with collective bargaining. Includes such topics as methods of handling industrial disputes, legal restrictions on various collective bargaining activities, theory and philosophy of collective bargaining, and internal union problems.

BSAD 262. ADMINISTRATION OF LABOR RELATIONS. (3)

Deals with labor relations at the plant level. Emphasizes the negotiation and administration of labor contracts. Includes union policy and influence on personnel management activities.

BSAD 263. COMPARATIVE THEORIES OF ORGANIZATION. (3)

Emphasizes business and other types of complex organizations. Theories of formal and informal organizations are covered. Analyzes the content, inter-

relationships, and similarities between current major schools or organization thought.

BSAD 264. BEHAVIORAL FACTORS IN MANAGEMENT. (3)

Required of M.B.A. candidates.

A critical analysis of the impact of the behavioral sciences on traditional concepts of management as process and as organization. Included within the area of analysis are such subjects as human motivation, human relations, morale, status, role, organization, communication, bureaucracy, the executive role, leadership and training.

BSAD 266. PERSONNEL MANAGEMENT: MANPOWER PROCUREMENT AND DEVELOPMENT. (3)

An "in depth" treatment of problems and techniques involved in obtaining and developing a competent work force. Manpower forecasting, job analysis, time study, recruitment techniques, psychological tests, interviews, application blanks, references, programmed instruction role playing, and sensitivity training are typical topics included.

BSAD 267. PERSONNEL MANAGEMENT: MANPOWER COMPENSATION AND EVALUATION. (3)

After a work force has been assembled and developed (BSAD 266), the manager must see to it that its potential is converted into efficient and continuing performance. This course provides an "in depth" analysis of the role of employee compensation and appraisal in accomplishing this end. Typical topics include wage theory, incentive systems, wage decision criteria, job evaluation, profit sharing, wage surveys, forced choice rating, critical incidents, appraisal interviews, and fringe benefits.

BSAD 269. APPLICATION OF BEHAVIORAL SCIENCE TO BUSINESS. (3)

Prerequisite—264 or consent of instructor.

This course stresses case analysis of behavioral knowledge applied to management problems. Typical topics include analysis of modes for introducing change, group versus organizational goals, organizational barriers to personal growth, the effect of authority systems on behavior, and the relationship between technology and social structure.

BSAD 270. TRANSPORTATION THEORY AND ANALYSIS. (3)

This course examines the transportation system and its components. Key topics in the development and present form of transport in both the United States and other countries are considered together with theoretical concepts employed in the analysis of transport problems.

BSAD 271. TRANSPORT AND PUBLIC POLICY. (3)

An intensive study of the nature and consequences of relations between governments and agencies thereof, carriers in the various modes, and users of transport services. Topical areas subjected to examination and analysis include the control of transport firms by regulatory bodies, taxation of carriers, methods employed in the allocation of funds to the construction, operation, and maintenance of publicly-provided transport facilities, and the direct subsidization of services supplied by privately-owned entities. Additional problems considered include labor and safety. Comparative international transport policies and problems are also examined.

BSAD 272. MANAGEMENT OF PHYSICAL DISTRIBUTION. (3)

Focuses on managerial practices required to fulfill optimally the physical movement needs of extractive, manufacturing, and merchandising firms.

Attention is given to the total cost approach to physical distribution. Interrelations among purchased transport services, privately-supplied transport services, warehousing, inventory control, materials handling, packaging, and plant location are considered. An understanding of the communications network to support physical distribution is developed in conjunction with study of the problems of coordination between the physical movement management function and other functional areas within the business firm—such as accounting, finance, marketing, and production.

BSAD 273. TRANSPORT STRATEGIES. (3)

Treats organization structure, policies, and procedures employed in the administration of inter- and intraurban transport firms. Problems receiving attention include managerial development, operational and financial planning and control, demand analysis, pricing, promotional policies, intra- and inter-model competitive and complementary relationships, and methods for accommodating public policies designed to delimit the managerial discretion of carrier executives. Administrative problems peculiar to publicly-owned and operated transport entities are also considered.

BSAD 274. BUSINESS LOGISTICS. (3)

Concentrates on the design and application of methods for the solution of advanced physical movement problems of business firms. Provides thorough coverage of a variety of analytical techniques relevant to the solution of these problems. Where appropriate, experience will be provided in the utilization of computers to assist in managerial logistical decision-making.

BSAD 275. TRANSPORTATION SCIENCE. (3)

Focuses on the application of quantitative and qualitative techniques of analysis to managerial problems drawn from firms in each of the various modes of transport. Included is the application of simulation to areas such as the control of equipment selection and terminal and line operations. The application of advanced analytical techniques to problems involving resource use efficiency within the transportation industry and between transportation and other sectors of the economy is an integral part of the course.

BSAD 281. PRIVATE ENTERPRISE AND PUBLIC SAFETY. (3)

Examines the executive's social and ethical responsibilities to his employees, customers, and to the general public. Consideration is given to the conflicts occasioned by competitive relationships in the private sector of business and the effect of institutional restraints. The trends in public policy and their future effect upon management are examined. For comparative purposes, several examples of planned societies are considered.

BSAD 282. PRODUCT, PRODUCTION AND PRICING POLICY. (3)

Required of M.B.A. Candidates.

The application of economic theory to the business enterprise in respect to the determination of policy and the handling of management problems with particular reference to the firm producing a complex line of products. Nature of competition. Pricing policy. Interrelationship of production and marketing problems. Basic types of cost. Control systems. Theories of depreciation and investment and the impact of each upon costs.

BSAD 283. MANAGEMENT POLICY FORMULATION. (3)

An integrative course which applies students' knowledge of the various functional areas in business administration to the formulation, execution, and evaluation of managerial policies. The viewpoint of the chief administrative officers and board of directors is emphasized.

BSAD 284. POLICY ISSUES IN PUBLIC UTILITIES. (3)

A critical analysis of current developments in regulatory policy and issues arising among public utilities, regulatory agencies, and the general public. Emphasis is placed on the electric, gas, water, and communications industries in both the public and private sectors of the economy. Changing and emerging problems stressed include those pertinent to cost analysis, depreciation, finance, taxes, rate of return, the rate base, differential rate-making, and labor. In addition, the growing importance of technological developments and their impact on state and federal regulatory agencies are explored.

BSAD 285. BUSINESS RESEARCH METHODOLOGY. (3)

Required of all D.B.A. Candidates.

Covers the nature, scope, and application of research methodology. The identification and formulation of research designs, applicable to business and related fields.

BSAD 287. INTERNATIONAL BUSINESS ADMINISTRATION. (3)

Examines the international business environment as it affects company policy and procedures. Integrates the business functions undertaken in international operations through analysis in depth and comprehensive case studies. This course can be credited toward the 18-hour requirement for a major field in the D.B.A. program.

BSAD 288. MANAGEMENT OF THE MULTINATIONAL FIRM. (3)

A course dealing with the problems and policies of international business enterprise at the management level. Considers management of a multinational enterprise as well as management within foreign units. The multinational firm as a socio-econometric institution is analyzed in detail. Cases in comparative management are utilized.

BSAD 289. DEVELOPMENT AND TRENDS IN PRODUCTION MANAGEMENT. (3)

Case studies of production problems in a number of industries. The course focuses attention on decisions concerning operating programs and manufacturing policies at the top level of manufacturing. Basic concepts of process and product technology are covered, taking into consideration the scale, operating range, capital cost, method of control, and degree of mechanization at each successive stage in the manufacturing process.

BSAD 298. INDEPENDENT STUDY IN BUSINESS ADMINISTRATION. (1-9)**BSAD 399. THESIS. (1-12)**

II. ECONOMICS

The program of studies in economics is designed to meet the needs of students who wish to concentrate either on a major or minor scale in this division of the social sciences. Students who expect to enroll in the professional schools and those who are planning to enter the fields of business, public administration, foreign service, or social service administration will find courses in economics of considerable value to them in their later work. A student of economics should choose courses to meet the requirements for his major objective. If he expects to pursue graduate study, he should consult Graduate School Announcements for the general requirements for advanced degrees.

Requirements for the Economics Major

In addition to the University requirements in General Education (see page —), the student majoring in economics is required to complete a minimum of 36 semester hours in economics with an average grade of not less than "C." Required courses are ECON 4, 31, 32, 102, and 132, and BSAD 130 (Statistics). Economics 111 may be taken in lieu of BSAD 130 by those with a strong background and interest in mathematics. A student will normally have earned nine semester-hours credit in the lower division courses in economics prior to beginning advanced work in the junior year. These lower division courses must be completed with an average grade of not less than "C."

Economics majors are expected to take ECON 102 prior to taking ECON 140 or 148 and Econ. 132 prior to taking ECON 142, 144, 160 or 170. ECON 102 and 132 will provide the theoretical foundation for "sections recommended for the economics major." Special sections for economics majors may be offered in ECON 140, 142, 148 and 160.

Other courses in economics to meet the requirements of the major are to be selected with the aid of a faculty adviser. Business Administration courses which may count as economics credit are BSAD 130, 131, 132, 134, 135, 164, and 184.

Economics majors enrolled in the College of Arts and Sciences must, of course, fulfill all of the specific requirements of that College; these include, for example, work in a foreign language. All economics majors must take six semester hours of mathematics.

Economics majors enrolled in the College of Business and Public Administration may elect to take a foreign language or, in lieu of foreign language, may take BSAD 10 and GEOG 15.

Economics majors are free to choose electives in other colleges of the University and are encouraged to study broadly in the social sciences, philosophy, mathematics, statistics, and accounting. Economics majors planning to do graduate work are advised to develop proficiency in mathematics through the calculus and in a foreign language.

An economics honors program is open to economics majors entering their junior year. Students must have an academic average of at least 3.0 to be eligible for admittance to this program.

Suggested Study Program For Economic Major

<i>Freshman Year</i>	<i>Hours</i>
ENGL 1—Composition and American Literature	3
MATH 10, 11 or 19, 20	6-8
ECON 4—Economic Developments	3
Social Science Elective	6
Fine Arts or Philosophy Elective	3
Foreign Language or BSAD 10 and Elective	6
HLTH 5—Science and Theory of Health (men and women)	2
Physical Activities (men and women)	2
Free Elective	3
Total	34-36

*Sophomore Year**Hours*

ENGL 3, 4—Composition & World Literature	6
ECON 31, 32—Principles of Economics	6
Foreign Language or GEOG 15 and elective	6
Natural Science (one biological and one physical)	7-8
History	6

Total 31-32

*Junior and Senior Years**Hours*

ECON 102—National Income Analysis	3
ECON 132—Intermediate Price Theory	3
BSAD 130—Business Statistics I	3
Electives in Economics and other subjects*	51

Total 60

*Normally these electives must be on the junior-senior level. Economics majors registered in the College of Arts and Sciences must take 18 semester hours in a minor (See Arts and Sciences Catalog for requirements of a minor).



ECONOMICS

Professors: DILLARD, CUMBERLAND, GRUCHY, O'CONNELL, SCHULTZE, ULMER, AND WONNACOTT.

Associate Professors: AARON, ALMON, BENNETT, BERGMANN, DODGE, DORSEY, HARRIS, KNIGHT, MCGUIRE, OLSON AND WEINSTEIN.

Assistant Professors: ADAMS, BOORMAN, CANTERBURY, CLAGUE, HAVRILESKY, HEXTER, HINRICHS, MAYOR, MEER, MEYER, QUALLS, SINGER AND SNOW.

Instructors: FITZMAURICE, KATZ, LARSON, LIND, AND RATHBUN.

Lecturers: AMUZEGAR, ANDERSEN, BACON, COHEN, DAY, GREEN, GREER, LOWER, MCLOONE, MEASDAY, MOORE, MUELLER, PIERCE, SCHINK, SHIPLEY, SPIEGEL, STROBER, TOBIN AND WILBER.

ECON 4. ECONOMIC DEVELOPMENTS. (3)

First and second semesters. Freshman requirement in business administration curriculums. An introduction to modern economic institutions—their origins, development, and present status. Commercial revolution, industrial revolution, and age of mass production. Emphasis on developments in England, Western Europe and the United States. (Dillard, Snow, Staff.)

ECON 31, 32. PRINCIPLES OF ECONOMICS. (3,3)

First and second semesters. Prerequisite, sophomore standing. Required in the business administration curriculums. In ECON 31 basic concepts, the monetary system, the national accounts, national income analysis, and business cycles are introduced. In ECON 32 emphasis is placed on price theory, distribution, international trade, and economic development. (Canterbury, Dorsey, Staff.)

ECON 37. FUNDAMENTALS OF ECONOMICS. (3)

First and second semesters. Not open to students who have credit in ECON 31 and 32. Not open to freshmen or to B.P.A. students. A survey of the general principles underlying economic activity; analysis of leading economic problems in the modern world. This is the basic course in economics for students who are unable to take the more complete course provided in ECON 31 and 32. (Ulmer, Staff.)

For Graduates and Advanced Undergraduates

ECON 102. NATIONAL INCOME ANALYSIS. (3)

First and second semesters. Prerequisite, ECON 32. Required for economics majors. National income and product accounts. Theory of the determination of national income and its components in a general equilibrium framework. (Mayor, Schink, Staff.)

ECON 103. AMERICAN ECONOMIC DEVELOPMENT. (3)

First and second semesters. Prerequisite, ECON 32 or 37. Long-term trends in the American economy and analysis of the sources of output growth. Technological changes and the diffusion of new technologies. These subjects are discussed in the context of theoretical economic models. (Shipley.)

ECON 105. INTRODUCTION TO ECONOMIC DEVELOPMENT OF UNDERDEVELOPED AREAS (3)

First and second semesters. Prerequisite, ECON 32 or 37. An analysis of the economic and social characteristics of underdeveloped areas. Recent theories of economic development; obstacles to development; policies and planning for development. (J. Q. Adams, Lower.)

ECON 106. ECONOMIC DEVELOPMENT OF SELECTED AREAS. (3)

Prerequisite, ECON 105. Institutional characteristics of a specific area are discussed and alternative strategies and policies for development are analyzed.

(Bennett, J. Q. Adams.)

ECON 111. QUANTITATIVE METHODS IN ECONOMICS. (3)

Economic theory as it relates to quantitative methods. The theory of statistical inference. (This course may be taken by economics majors instead of, but not in addition to, BSAD 130).

(Boorman.)

ECON 120. INTRODUCTION TO REGIONAL AND URBAN ECONOMICS. (3)

Prerequisite, Economics 102 or consent of Instructor. A study of the theories, problems, and policies of urban and regional economic development. (Harris.)

ECON 130. MATHEMATICAL ECONOMICS. (3)

First and second semesters. Prerequisites, ECON 102 and 132 and one year of mathematics. A course designed to enable economics majors to understand the simple aspects of mathematical economics. Those parts of the calculus and algebra required for economic analysis will be presented.

(Hexter.)

ECON 131. COMPARATIVE ECONOMIC SYSTEMS. (3)

First and second semesters. Prerequisites, ECON 32 or 37. An investigation of the theory and practice of various types of economic systems. An examination and evaluation of the capitalistic system followed by an analysis of alternative types of economic systems such as fascism, socialism, and communism.

(Gruchy, Lower, Amuzegar.)

ECON 132. INTERMEDIATE PRICE THEORY. (3)

First and second semesters. Prerequisite, ECON 32. Required for economics majors. This course is an analysis of price and distribution theory with special attention to recent developments in the theory of imperfect competition.

(Ulmer, Staff.)

ECON 134. CONTEMPORARY ECONOMIC THOUGHT. (3)

Prerequisites, ECON 32 and senior standing. Graduate students should take ECON 232. A survey of recent trends in American, English, and Continental economic thought with special attention to the work of such economists as W. C. Mitchell, J. R. Commons, T. Veblen, W. Sombart, J. A. Hobson and other contributors to the development of economic thought since 1900.

(Gruchy, Lower.)

ECON 137. THE ECONOMICS OF NATIONAL PLANNING. (3)

Prerequisite, ECON 32 or 37 and senior standing. An analysis of the principles and practice of economic planning with special reference to the planning problems of western European countries and the United States.

(Gruchy, Almon.)

ECON 138. ECONOMICS OF THE SOVIET UNION. (3)

First and second semesters. Prerequisite, ECON 32 or 37. An analysis of the organization, operating principles and performance of the Soviet economy with attention to the historical and ideological background, planning, resources, industry, agriculture, domestic and foreign trade, finance, labor, and the structure and growth of national income.

(Dodge.)

ECON 140. MONEY AND BANKING. (3)

First and second semesters. Prerequisite, ECON 32 or 37. A study of the relation of money and credit to economic activity and prices; the impact of public policy in financial markets and in markets for goods and services; policies, structure, and functions of the Federal Reserve System; organization, operation, and functions of the commercial banking system, as related particularly to questions of economic stability and public policy.

(Meyer, Havrilesky, Boorman.)

ECON 141. THEORY OF MONEY, PRICES AND ECONOMIC ACTIVITY. (3)

Second semester. Prerequisite, ECON 140. A theoretical treatment of the influence of money and financial markets on economic activity and prices, and of the effects of monetary policy on the markets for goods and services; the role of money in the classical and Keynesian macro-systems; topics of theoretical interest in monetary policy formation and implementation.

(Meyer, Havrilesky)

ECON 142. INTRODUCTION TO PUBLIC FINANCE. (3)

First and second semesters. Prerequisite, ECON 32 or 37. A study of the issues in mobilizing resources to meet public wants through federal, state, and local governments; principles and policies of taxation, debt management, and governmental expenditures and their effects on resource allocation, stabilization of income and prices, income distribution and economic growth.

(Hinrichs, Dorsey, Singer.)

ECON 143. THEORY OF PUBLIC FINANCE. (3)

Prerequisite, ECON 142 and 102, or consent of instructor. Advanced analysis of the theory and practice of public finance, including taxation, debt management, expenditures, and fiscal policy.

(Aaron, Singer.)

ECON 144. STATE AND LOCAL PUBLIC FINANCE. (3)

Prerequisite, ECON 32 or 37. Principles and problems of governmental finance with special reference to state and local jurisdictions. Topics to be covered include taxation, expenditures, and intergovernmental fiscal relations.

ECON 147. BUSINESS CYCLES. (3)

First semester. Prerequisite, ECON 140. A study of the causes of depressions and unemployment, cyclical and secular instability, theories of business cycles, and the problem of controlling economic instability.

(Mayor.)

ECON 148. INTERNATIONAL ECONOMICS. (3)

First and second semesters. Prerequisite, ECON 32 or 37. A descriptive and theoretical analysis of international trade; balance of payments accounts; the mechanism of international economic adjustment; comparative costs; economics of customs unions.

(Wonnacott, Clague, Moore.)

ECON 149. INTERNATIONAL ECONOMIC POLICIES. (3)

First and second semesters. Prerequisite, ECON 148. Contemporary balance of payments problems; the international liquidity controversy; investment, trade and economic development; evaluation of arguments for protection.

(Canterbery.)

ECON 160. LABOR ECONOMICS. (3)

First and second semesters. Prerequisite, ECON 32 or 37. The historical development and chief characteristics of the American labor movement are first surveyed. Present-day problems are then examined in detail: wage theories, unemployment, social security, labor organization, and collective bargaining.

(Knight, Strober.)

ECON 161. CURRENT PROBLEMS IN LABOR ECONOMICS. (3)

Prerequisite, ECON 160. A detailed examination of current problems in labor economics including; labor market and manpower problems, unemployment compensation and social security, wage theories, and productivity analysis.

(Weinstein, Knight.)

ECON 170. INDUSTRIAL ORGANIZATION. (3)

Prerequisite, ECON 32 or 37. Changing structure of the American economy; price policies in different industrial classifications of monopoly and competition in relation to problems of public policy.

(Qualls, Greer.)

ECON 171. ECONOMICS OF AMERICAN INDUSTRIES. (3)

First and second semesters. Prerequisite, ECON 32 or 37. A study of the technology, economics and geography of representative American industries.

(Measday, Greer.)

ECON 196, 197. HONORS SEMINAR. (3,3)

First and second semesters. Normally taken in the junior year. Prerequisite, candidacy for honors in Economics. Selected topics are investigated, and written reports are submitted.

(Gruchy.)

ECON. 198. INDEPENDENT HONORS STUDY. (3)

First semester. Normally taken in the senior year. Prerequisites, Economics 196, 197 and candidacy for honors in Economics. Integrated reading under staff direction, leading to the preparation of a thesis in Economics 199.

(Staff)

ECON 199. HONORS THESIS. (3)

Second semester. Prerequisites, Economics 198 and candidacy for honors in Economics. General supervision will be provided through assembled meetings with the professor in charge of the course.

(Staff.)

*For Graduates***ECON 200. MICRO-ECONOMIC ANALYSIS. (3)**

First semester. This course and its sequel, ECON 201, analyze the usefulness and the shortcomings of prices in solving the basic economic problem of allocating scarce resources among alternative uses. Competitive model and the theory of imperfect competition. Central problem of welfare economics and general equilibrium. Detailed analysis of the theory of production and consumption. An acquaintance with calculus or concurrent enrollment in ECON 211 is presumed.

(Ulmer, Almon.)

ECON 201. ADVANCED MICRO-ECONOMIC ANALYSIS. (3)

Second semester. Prerequisite, ECON 200. A continuation of ECON 200. Theory of wages, capital and interest. Qualifications of the basic welfare theorem caused by non-competitive market structures, external economies and diseconomies, and secondary constraints. Application of price theory to public expenditure decisions, investment in human capital, international trade, and other areas of economics.

(Ulmer, Almon.)

ECON 202. MACRO-ECONOMIC ANALYSIS. (3)

First semester. ECON 202 and 247 form a two-semester sequence in macro-economic theory. Aggregate general equilibrium theory, including an analysis of alternative theories—classical, Keynesian, and their more recent refinements.

(Bergmann, Mayor.)

ECON 203. SEMINAR IN AMERICAN ECONOMIC DEVELOPMENT. (3)

Second semester. Selected topics in the long-term movements of the American economy. Quantitative studies of the growth of output; applications of econometric methods and economic theory to topics in American economic history.

(Olson.)

ECON 204. ORIGINS AND DEVELOPMENTS OF CAPITALISM. (3)

First semester. Study of the transition from feudalism to capitalism and the subsequent development of leading capitalist institutions in industry, agriculture, commerce, banking, and the social movement.

(Dillard, Olson.)

ECON 205. ECONOMIC DEVELOPMENT OF UNDERDEVELOPED AREAS. (3)

First semester. Prerequisite, ECON 102 and 132. An analysis of the forces contributing to and retarding economic progress in underdeveloped areas. Macro- and micro-economic aspects of development planning and strategy are emphasized.

(Bennett.)

ECON 206. SEMINAR IN ECONOMIC DEVELOPMENT. (3)

Second semester. Prerequisite, ECON 205 or consent of instructor. A continuation of ECON 205. Special emphasis is on the application of economic theory in the institutional setting of a country or area of particular interest to the student. (Bennett.)

ECON 207. MONEY AND FINANCE IN ECONOMIC DEVELOPMENT. (3)

Second semester. Economic theory, strategy and tactics for mobilizing real and financial resources to finance and accelerate economic development. Monetary, fiscal, and tax reform policy and practice by the government sector to design and implement national development plans. (Hinrichs.)

ECON 209. WELFARE ECONOMICS. (3)

Prerequisite, ECON. 200. The topics covered include Pareto optimality, social welfare functions, indivisibilities, consumer surplus, output and price policy in public enterprise, and the welfare aspects of the theory of public expenditures. (McGuire, Meer.)

ECON 211. QUANTITATIVE ECONOMICS I. (3)

First semester. An introduction to the theory and practice of statistical inference. Elements of computer programming and a review of mathematics germane to this and other graduate economics courses are included.

(Bergmann, Hexter, Green.)

ECON 212. QUANTITATIVE ECONOMICS II. (3)

Second semester. Prerequisite, ECON 211. Techniques of estimating relationships among economic variables. Multiple regression, the analysis of variance, and techniques for dealing in time series. Further topics in mathematics.

(Bergmann, Hexter, Green.)

ECON 214. ADVANCED MATHEMATICAL ECONOMICS. (3)

First semester. Optimization techniques such as Lagrangian multipliers and linear programming. Mathematical treatment of general equilibrium, including interindustry analysis, the theory of production, consumption, and welfare. Multisectoral growth models and questions of optimal growth. The course assumes a background in calculus and matrix algebra such as provided by ECON 211 and ECON 212. (Almon)

ECON 215. SEMINAR IN MATHEMATICAL ECONOMICS. (3)

Second semester. Prerequisite, ECON 214. The topic of the seminar changes from year to year. (Almon)

ECON 217. ECONOMETRICS I. (3)

First semester. Special topics in mathematical statistics necessary for understanding econometric theory, with particular emphasis on multivariate analysis. The estimation of simultaneous equation systems, problems involving errors in variables, distributed lags, and spectral analysis. (Hexter.)

ECON 218. SEMINAR IN QUANTITATIVE ECONOMICS. (3)

Prerequisite, ECON 212 or consent of instructor. Analysis of data sources for economic research; critical evaluation of previous and current quantitative economic studies; and class discussion and criticism of student research projects. (Cohen.)

ECON 220. ADVANCED REGIONAL AND URBAN ECONOMICS. (3)

First semester. Location theory and the spatial distributions of economic activity. The application to problems of natural resource management, environmental quality, and regional and interregional development of such analytic methods as input-output techniques, social accounting systems, and industrial complex analysis. (Cumberland.)

ECON 221. SEMINAR IN REGIONAL AND URBAN ECONOMICS. (3)

Second semester. Selected topics and techniques in regional and urban economic analysis, including models for economic projections, urban growth, and regional development. (Harris.)

ECON 230. HISTORY OF ECONOMIC THOUGHT. (3)

First semester. Prerequisite, ECON 132 or consent of the instructor. A study of the development of economic thought and theories including the Greeks, Romans, canonists, mercantilists, physiocrats, Adam Smith, Malthus, Ricardo. Relation of ideas to economic policy. (Dillard, Spiegel.)

ECON 231. ECONOMIC THEORY IN THE NINETEENTH CENTURY. (3)

Second semester. Prerequisite, ECON. 230 or consent of the instructor. A study of nineteenth- and twentieth-century schools of economic thought, particularly the classicists, neo-classicists, Austrians, German historical school, American economic thought and the socialists. (Dillard, Spiegel.)

ECON 232, 233. SEMINAR IN INSTITUTIONAL ECONOMIC THEORY. (3, 3)

A study of the recent developments in the field of institutional economic theory in the United States and abroad. (Gruchy.)

ECON 234. ECONOMIC GROWTH IN MATURE ECONOMIES. (3)

Analysis of policies and problems for achieving stable economic growth in mature economies such as the United States, the United Kingdom, and the Scandinavian countries. (Gruchy.)

ECON 235. ADVANCED INTERNATIONAL ECONOMIC RELATIONS. (3)

First semester. The international mechanism of adjustment: price, exchange rate, and income changes. Comparative costs, factor endowments, and the gains from trade. Commercial policy and the theory of customs unions. (Wonnacott.)

ECON 236. SEMINAR IN INTERNATIONAL ECONOMIC RELATIONS. (3)

Second semester. Selected problems in international economics. (Wonnacott.)

ECON 237. SELECTED TOPICS IN ECONOMICS. (3)

Arranged individually with professors.

ECON 238. SEMINAR IN ECONOMIC DEVELOPMENT OF THE SOVIET UNION. (3)

Second semester. Prerequisite, ECON 138 or consent of instructor. Measurement and evaluation of Soviet economic growth including interpretation and use of Soviet statistics, measurement of national income, fiscal policies, investment and technological change, planning and economic administration, manpower and wage policies, foreign trade and aid. Selected topics in Bloc development. (Dodge.)

ECON 240. MONETARY THEORY AND POLICY. (3)

First semester. An adequate knowledge of micro- and macro-economics is assumed. Theory of money, financial assets, and economic activity; review of classical, neo-classical and Keynesian contributions; emphasis on post-Keynesian contributions, including those of Tobin, Patinkin, Gurley-Shaw, Friedman, and others. (Meyer.)

ECON 241. SEMINAR IN MONETARY THEORY AND POLICY. (3)

Second semester. Prerequisite, ECON 240 or consent of instructor. Theory of the mechanisms through which central banking affects economic activity and prices; formation and implementation of monetary policy; theoretical topics in monetary policy. (Meyer.)

ECON 242. ADVANCED THEORY OF PUBLIC FINANCE. (3)

Review of utility analysis to include the theory of individual consumer resource allocation and exchange and welfare implications. Effects of alternative tax and

subsidy techniques upon allocation, exchange, and welfare outcomes. Theories of public goods, their production, exchange and consumption. Resource allocation outcomes of small group decisions. Principles of benefit-cost analysis for government decisions. (Schultze, McGuire.)

ECON 243. SEMINAR IN PUBLIC FINANCE. (3)

Theory of taxation; empirical studies with reference primarily to the United States. The burden of the public debt. Budget concepts and their relationship to fiscal policy. (Aaron.)

ECON 245. ECONOMICS OF DEFENSE. (3)

Prerequisite, ECON 200. Defense systems analysis. A review of the program-budget system and an evaluation of resource management in the defense program.

ECON 246. PUBLIC SECTOR WORKSHOP. (3)

Second semester. Representative problems in analysis for public decision making; measurement of benefits and costs; incommensurabilities in benefits, and ambiguities in cost; criteria for program and project selection; effects of uncertainty; time-horizon considerations; joint costs and multiple benefits; non-quantifiable factors in decision analysis. Examples will be taken from current government programs. (McGuire.)

ECON 247. ECONOMIC GROWTH AND INSTABILITY. (3)

Second semester. A continuation of ECON. 202 with emphasis on the theory of economic growth in developed economies; the basic Harrod-Domar models and more complex ones, both neoclassical (Solow, Tobin) and Keynesian (Kaldor, Champernowne). Models of embodied technological progress and various input-augmenting formulations. Sources of economic growth, parameters of production functions, and the rate and character of technological advance. (Bergmann, Mayor, Schultze.)

ECON 248. THE ECONOMICS OF TECHNICAL CHANGE. (3)

Prerequisite, consent of instructor. Determinants and impact of inventions and innovations. Qualitative and quantitative aspects of technical change at the micro- and macro-economic levels and under different conditions of economic development.

ECON 260. SEMINAR IN LABOR ECONOMICS. (3)

First semester. Formal models of labor demand, supply, utilization and price formation. Factors affecting labor supply; the determination of factor shares; bargaining models, labor resources. Trade union theories as they affect resource allocation. (Weinstein.)

ECON 261. SELECTED TOPICS IN LABOR ECONOMICS. (3)

Second semester. Variation in labor market and labor organization; labor in stages of economic development. Manpower development. Aggregate problems of price and employment stability. Alternative theories of public policy toward labor markets. (Knight.)

ECON 266. SEMINAR IN THE ECONOMICS OF HUMAN RESOURCES. (3)

Prerequisite, consent of the instructor. (Weinstein.)

ECON 270. ADVANCED INDUSTRIAL ORGANIZATION. (3)

First semester. Prerequisite, ECON 102 and 132 or consent of instructor. Analysis of market structure and its relation to market performance. (Mueller.)

ECON 271. INDUSTRIAL ORGANIZATION AND PUBLIC POLICY. (3)

Second semester. Prerequisite, ECON 270 or consent of instructor. Analysis of

the problems of public policy in regard to the structure, conduct, and performance of industry. Examination of anti-trust policy from the point of view of economic theory. (Mueller.)

ECON 399. THESIS RESEARCH.
Arranged.

III. GEOGRAPHY

Geography studies the spatial patterns and interactions of natural, cultural, and socio-economic phenomena on the earth's surface. The field thus embraces aspects of both the physical and the social sciences, which are applied in the analysis of patterns of distribution of individual phenomena, to the study of complex interrelations of phenomena found in a given region, and to the synthesis of geographic regions. A geographer should, therefore, acquire background knowledge in certain aspects of the physical as well as the social sciences.

Field work and map analysis have been the basic tools of research for the geographer. In recent years these have been augmented by the use of techniques of air photo interpretation and presently by the development of methods of interpreting data obtained from the remote sensing devices of space satellites. Modern geography also is making increasing application of quantitative methods, including the use of statistics and systems analysis, so that mathematical training is becoming increasingly important for a successful career in geography.

Today geographers are employed in a wide range of positions. Geographers in the federal government work in the Departments of State, Interior, Defense, Agriculture, Housing and Urban Affairs, Health, Education, and Welfare, and are on the staffs of the legislative research branch, the Library of Congress and the National Archives. At the state and local government level there is an increasing demand for geographers in planning positions. And in recent years more and more geographers have found employment in private industry working on problems of industrial and commercial location and market analysis. Teaching at all levels from elementary school through graduate work continues to employ more geographers each year. Some have found geography to be an excellent background for careers in the military, in journalism, and general business; others have simply found the broad perspective of geography an excellent base for a general education. Most professional positions in geography require graduate training.

Requirement for an Undergraduate Major

Because geography draws students with such a variety of career and education aims the Department has established major programs in both the College of Business and Public Administration and in Arts and Sciences. Moreover students in the College of Education and the Department of Secondary Education can specialize in geography as their content field.

Within any of the general major programs it is possible for the student to adjust his program to fit his particular individual interests, for the major requirement in both BPA and A & S consists of a basic core of prescribed courses and a number of electives selected by the student in consultation with a departmental advisor. The major totals 33 semester hours.

The required courses of the geography core are:

GEOG 10—General Geography I, Physical Geography	3 hrs.
GEOG 11—General Geography II, Human Geography	3 hrs.

GEOG 30—Principles of Morphology	3 hrs.
GEOG 42—Fundamentals of Meteorology & Climatology	3 hrs.
GEOG 170—Local Field Course	3 hrs.
GEOG 199—Undergraduate Research	3 hrs.
One regional geography course	3 hrs.
Total	21 hrs.

The lower division courses in the geography core should be taken before taking any upper division courses toward the major.

Areas of Specialization

Although the major program is flexible and can be designed to fit any individual student's own interest, several specializations attract numbers of students. They are:

Urban Geography—Provides preparation for careers in planning and teaching. Majors electing this specialty take departmental courses in urban geography, industrial location, transportation, and economic geography among others and supporting courses in urban sociology, urban economics, and urban transportation outside the department.

Physical Geography—This area of interest calls for courses in geomorphology, climatology, and resources and supporting courses in geology, agronomy, fluid mechanics, and botany.

Cartography—Prepares students for careers in map design and interpretation and in photo analysis. The department offers various courses in map drafting, cartographic theory, map evaluation, and map and photo interpretation and students can take supporting courses in art, civil engineering.

Cultural Geography—Of interest to students particularly concerned with the geographic aspects of population, politics, and other social and cultural phenomena, and in historical geography. In addition to departmental course offerings this specialization depends on work in sociology, anthropology, government and politics, history and economics. For further information on any of these areas of interest the student should contact a departmental advisor.

Geography majors in the College of Arts and Sciences must take 12 hours of foreign language, unless qualifying for fewer hours, but majors in BPA have the option of substituting at least 12 hours in courses developing competence in quantitative methods, to the extent that these courses have not been taken in the General Education Program.

Alternative quantitative method sequences:

1. For a student who has taken MATH 010, the sequence can be MATH 011, 014, and 015 and any one of these quantitative courses: BSAD 130, SOCY 95, or PSYC 90. The 12 hours can also be satisfied by taking only MATH 011 and 014 and then BSAD 130 and 131, but any of the other courses, SOCY 95 or PSYC 90, will be considered duplications between themselves and BSAD 130.

2. A student who has taken MATH 018 follows the sequence of MATH 019, 020, 021. He can complete his twelve credits with only the mathematics courses or combine with three credits from either BSAD 130, SOCY 95 or PSYC 90; or with six credits from BSAD 130 and BSAD 131.

RECOMMENDED STUDY PROGRAM FOR GEOGRAPHY MAJORS IN
THE COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

<i>Freshman Year</i>	<i>Hours</i>	
GEOG 10, 11—General Geography	6	
BOTN 1—General Botany	4	
GEOL 1—Geology	3	
HISTORY—Towards general education requirement	3	
ENGLISH 1—Composition	3	
PHIL 41—Elementary Logic and Semantics	3	
MATH 10 or 18—Towards general education requirement	3	
HLTH 5—Health Education	2	
Physical Activities—(Men and Women)	2	
Foreign Language	6	
Alternative to foreign language (MATH 11 or 19)		3/4
	35	32/33

<i>Sophomore Year</i>		
GEOG 30—Principles of Morphology	3	
GEOG 42—Fundamentals of Meteorology & Climatology	3	
HISTORY—Towards general education requirement	3	
ENGL 3, 4—World Literature	6	
ECON 31, 32—Principles of Economics	6	
One Soc. Science—(ANTH 1, Soc. 1, G&P 1, PSYC 1)	3	
One elective—(depending on area of specialization)	3	
Foreign Language	6	
Alternative to foreign language (MATH 14, 15 or 20)		6/4
	33	33/31

<i>Junior Year</i>		
BOTN 113—Plant Geography	2	
AGRO 114—Soil Classification and Geography	4	
GEOG —Selection to fit student's needs	9	
Electives—(Depending on area of specialization)	18	15
Alternative to foreign language (BSAD 130)		3
		<hr/>
(or any other suitable combination)	33	33

<i>Senior Year</i>		
GEOG 170—Local Field Course	3	
GEOG 199—Undergraduate Research	3	
GEOG —Selection to fit student's needs	6	minimum
Electives—(Depending on area of specialization)	12 to 15	
	<hr/>	
	24 to 27	

RECOMMENDED STUDY PROGRAM FOR GEOGRAPHY MAJORS IN THE COLLEGE OF ARTS AND SCIENCES

<i>Freshman Year</i>	<i>Hours</i>
GEOG 10, 11—General Geography	6
MATH 3 or 10—Fundamentals of Mathematics or Introduction to Mathematics	4/3
BOTN—General Botany	3
GEOL 1—Geology	3
ENGL 1—Composition	3
Foreign Language	6
PHIL 41—Elementary Logic	3
HLTH 5—Health Education	2
Physical Activities—(men and women)	2
	<hr/>
	33/32
<i>Sophomore Year</i>	
GEOG 30—Principles of Morphology	3
GEOG 42—Fundamentals of Meteorology and Climatology	3
History—To complete 6 hours of general education requirements	6
Foreign Language	6
ECON 37—Fundamentals of Economics	3
One Social Science—(ANTH 1, SOCY 1, GVPT 1, PSYC 1)	3
SPCH 1—Public Speaking	3
	<hr/>
	33
<i>Junior Year</i>	
BOTN 113—Plant Geography	2
AGRO 114—Soil Classification and Geography	4
GEOG —Selection to fit student's needs	9
Electives—(depending on area of specialization)	18
	<hr/>
	33
<i>Senior Year</i>	
GEOG 170—Local Field Course	3
GEOG 199—Undergraduate Research	3
GEOG —Selection to fit student's needs	6 minimum
Electives—(depending on area of specialization)	13/15
	<hr/>
	25/27

Geography Minor and Secondary Education Geography Specialization

Geography minors should take Geography 10 and 11 before taking other geography courses. It is suggested that students consult with a departmental advisor to plan the most effective minor program.

Secondary Education Majors with a concentration in geography are required to take Geography 10 and 11; two of the following courses—GEOG 15, 30, and 42; GEOG 103 or its equivalent as approved by the department; 6 hours of upper-division systematic courses (126, 146, 155, 156, 160, 161, 163, 190, 191, 195, 196, 197), 3 hours of regional geography, and GEOG 199.

GEOGRAPHY

Professors: AHNERT, DESHLER, HARPER, HU

Associate Professors: CHAVES, FONAROFF

Assistant Professors: BRODSKY, WIEDEL

Lecturers: DANDO, GROVES, HOLMES, KINERNEY, VOLK

GEOG 10, 11. GENERAL GEOGRAPHY. (3, 3)

First and second semesters. GEOG 10 is suggested for students of Arts and Sciences. Education and those who desire a preparation for further study in geography. It also will serve as a preparation for the regional studies. Geog 10 and 11 are required of all majors in geography and are recommended for minors. First part: an introduction to the various subdivisions of geography, to the nature and use of maps, to major principles and basic terminology. Second part: a study of the philosophy, techniques, aspects of literature and applications of geography.

GEOG 15. INTRODUCTORY ECONOMIC GEOGRAPHY. (3)

A study of physical and economic factors that underlie production. The roles of climate, soils, and landforms; the nature and geographic distribution of agricultural, power and mineral resources, and the nature and uses of cartographic materials. (Staff.)

GEOG 30. PRINCIPLES OF MORPHOLOGY. (3)

A study of the physical features of the earth's surface and their geographic distribution, including subordinate land forms. Major morphological processes, the development of land forms, and the relationships between various types of land forms and land use problems. (Ahnert.)

GEOG 42. FUNDAMENTALS OF METEOROLOGY AND CLIMATOLOGY. (3)

Prerequisite, GEOG 10, or permission of the instructor. An introduction to atmospheric processes and their geographical implications. Emphasis is placed on basic weather elements and their relationship to the controls and distribution of world climates.

For Graduates and Advanced Undergraduates

GEOG 100. REGIONAL GEOGRAPHY OF EASTERN ANGLO-AMERICA. (3)

Prerequisite, GEOG 10 or GEOG 15, or permission of the instructor. A study of the cultural and economic geography and the geographic regions of eastern United States and Canada, including an analysis of the significance of the physical basis for present-day diversification of development, and the historical geographic background.

GEOG 101. REGIONAL GEOGRAPHY OF WESTERN ANGLO-AMERICA. (3)

Prerequisite, GEOG 10 or GEOG 15, or permission of the instructor. A study of western United States, western Canada, and Alaska along the lines mentioned under GEOG 100.

GEOG 103. GEOGRAPHIC CONCEPTS AND SOURCE MATERIALS. (3)

A comprehensive and systematic survey of geographic concepts designed exclusively for teachers. Stress will be placed upon the philosophy of geography in relation to the social and physical sciences, the use of the primary tools of geography, source materials, and the problems of presenting geographic principles.

GEOG 104. GEOGRAPHY OF MAJOR WORLD REGIONS. (3)

A geographic analysis of the patterns, problems, and prospects of the world's principal human-geographic regions, including Europe, Anglo-America, the Soviet Union, the Far East, and Latin America. Emphasis upon the causal factors of differentiation and the role geographic differences play in the interpretation of the current world scene. This course is designed especially for teachers.

GEOG 105. GEOGRAPHY OF MARYLAND AND ADJACENT AREAS. (3)

An analysis of the physical environment, natural resources, and population in relation to agriculture, industry, transport, and trade in the state of Maryland and adjacent areas.

GEOG 110. ECONOMIC AND CULTURAL GEOGRAPHY OF CARRIBEAN AMERICA. (3)

An analysis of the physical framework, broad economic and historical trends, cultural patterns, and regional diversification of Mexico, Central America, the West Indies, and parts of Colombia and Venezuela. (Chaves.)

GEOG 111. ECONOMIC AND CULTURAL GEOGRAPHY OF SOUTH AMERICA. (3)

A survey of natural environment and resources, economic development and cultural diversity of the South American republics, with emphasis upon problems and prospects of the countries. (Chaves.)

GEOG 120. GEOGRAPHY OF EUROPE. (3)

First and second semesters. Agricultural and industrial development of Europe and present-day problems in relation to the physical and cultural setting of the continent and its natural resources.

GEOG 122. ECONOMIC RESOURCES AND DEVELOPMENT OF AFRICA. (3)

The natural resources of Africa in relation to agricultural and mineral production; the various stages of economic development and the potentialities of the future. (Deshler.)

GEOG 125. GEOGRAPHY OF ASIA. (3)

Lands, climates, natural resources and major economic activities in Asia (except Soviet Asia). Outstanding differences between major regions. (Hu.)

GEOG 126. CULTURAL GEOGRAPHY. (3)

Prerequisite, GEOG 10, GEOG 11, or consent of instructor. An analysis of the impact of man through his ideas and technology on the evolution of geographic landscapes. Major themes in the relationships between cultures and environments.

GEOG 130. ECONOMIC AND POLITICAL GEOGRAPHY OF EASTERN ASIA. (3)

Study of China, Korea, Japan, the Philippines; physical geographic setting; population; economic and political geography. Potentialities of major regions and recent developments. (Hu.)

GEOG 131. ECONOMIC AND POLITICAL GEOGRAPHY OF SOUTH AND SOUTHEAST ASIA. (3)

Study of the Indian subcontinent, Farther India, Indonesia: physical geographic setting; population; economic and political geography. Potentialities of various countries and regions and their role in present Asia. (Hu.)

GEOG 134. CULTURAL GEOGRAPHY OF CHINA AND JAPAN. (3)

Survey of geographical distribution and interpretation of cultural patterns of China and Japan. Emphasis on basic cultural institutions, outlook on life, unique characteristics of various groups. Trends of cultural change and contemporary problems. (Hu.)

GEOG 140. GEOGRAPHY OF THE SOVIET UNION. (3)

The natural environment and its regional diversity. Geographic factors in the expansion of the Russian state. The geography of agricultural and industrial production, in relation to available resources, transportation problems, and diversity of population. (Dando.)

GEOG 145. SYSTEMATIC AND REGIONAL CLIMATOLOGY. (3)

Prerequisite, GEOG 42, or permission of instructor. Methodology and techniques of collecting and evaluating climatological information. A critical examination of climatic classifications. Distribution of world climates and their geographical implications.

GEOG 146. REGIONAL GEOMORPHOLOGY. (3)

Regional and comparative morphology, with special emphasis upon Anglo-America. (Ahnert.)

GEOG 150. HISTORY AND THEORY OF CARTOGRAPHY. (3)

The development of maps throughout history. Geographical orientation, coordinates, and map scales. Map projections, their nature, use and limitations. Principles of representation of features on physical and cultural maps. Modern uses of maps and relationships between characteristics of maps and use types.

GEOG 151, 152. CARTOGRAPHY AND GRAPHICS PRACTICUM. (3, 3)

One hour lecture and two two-hour laboratory periods a week. Techniques and problems of compilation, design, and construction of various types of maps and graphs. Relationships between map making and modern methods of production and reproduction. Trips to representative plants. Laboratory work directed toward cartographic problems encountered in the making of nontopographic maps. (Wiedel.)

GEOG 153. PROBLEMS OF CARTOGRAPHY REPRESENTATION AND PROCEDURE. (3)

Two hours lecture and two hours laboratory a week. Study of cartographic compilation methods. Principles and problems of symbolization, classification, and representation of map data. Problems of representation of features at different scales and for different purposes. Place-name selection and lettering; stick-up and map composition.

GEOG 154. PROBLEMS OF MAP EVALUATION. (3)

Two hours lecture and two hours laboratory a week. Schools of topographic concepts and practices. Theoretical and practical means of determining map reliability, map utility, and source materials. Nature, status, and problems of topographic mapping in different parts of the world. Non-topographic special use maps. Criteria of usefulness for purposes concerned and of reliability. (Wiedel.)

GEOG 155. INTERPRETATION OF TOPOGRAPHIC MAPS AND AERIAL PHOTOGRAPHS. (3)

Two hours of lecture and two hours of laboratory per week. Interpretation of aerial photographs with emphasis on the recognition of landforms of different types and man-made features. Study of vegetation, soil, and other data that may be derived from aerial photographs. Types of aerial photographs and limitations of photo interpretation.

GEOG 156. QUANTITATIVE METHODS IN GEOGRAPHY. (3)

Prerequisite, MATH 10 and 11, SOCY or BSAD 130 or consent of instructor. The geographic applications of statistical methods. Emphasis will be placed on sources of quantitative data useful to geographers, measurements of location and association, and graphic analysis and representation of quantitative data.

- GEOG 160. ADVANCED ECONOMIC GEOGRAPHY I. AGRICULTURAL RESOURCES. (3)**
Prerequisite, GEOG 10 or GEOG 15. The nature of agricultural resources, the major types of agricultural exploitation in the world, and the geographic distribution of certain major crops and animals in relation to physical environment and economic geographic conditions. Main problems of conservation.
- GEOG 161. ADVANCED ECONOMIC GEOGRAPHY II. MINERAL RESOURCES. (3)**
Prerequisite, GEOG 10 or GEOG 15. The nature and geographic distribution of the principal power, metallic and other minerals. Economic geographic aspects of modes of exploitation. Consequences of geographic distribution and problems of conservation. (Holmes.)
- GEOG 163. WATER RESOURCES AND WATER RESOURCE PLANNING. (3)**
GEOG 10 or 15, or permission of instructor. Water as a component of the human environment. A systematic examination of various aspects of water, including problems of domestic and industrial water supply, irrigation, hydro-electric power, fisheries, navigation, flood damage reduction and recreation. (Volk.)
- GEOG 170. LOCAL FIELD COURSE. (3)**
Training in geographic field methods and techniques. Field observation of land use in selected rural and urban areas in eastern Maryland. One lecture per week with Saturday and occasional weekend field trips. Primarily for undergraduates.
- GEOG 180. SCIENTIFIC METHODOLOGY AND HISTORY OF GEOGRAPHY. (3)**
For undergraduate and graduate majors in Geography. May be taken also by students with a minimum of nine hours in systematic and six hours in regional geography. A comprehensive and systematic study of the history, nature, and basic principles of geography, with special reference to the major schools of geographic thought; a critical evaluation of some of the important geographical works and methods of geographic research. (Hu.)
- GEOG 190. POLITICAL GEOGRAPHY. (3)**
Geographical factors in national power and international relations; an analysis of the role of "geopolitics" and "geostrategy," with special reference to the current world scene. (Chaves.)
- GEOG 191. POPULATION GEOGRAPHY. (3)**
Prerequisite, GEOG 10 or 15, or permission of the instructor. An analysis of world population distribution patterns as revealed by demographic data. Emphasis is placed upon a comparison of population density, growth, composition and migration with natural resources and state of technological advancement. Case studies from the Geographical literature will be used. (Fonaroff.)
- GEOG 195. GEOGRAPHY OF TRANSPORTATION. (3)**
The distribution of transport routes on the earth's surface; patterns of transport routes; the adjustment of transport routes and media to conditions of the natural environment centers and their distribution.
- GEOG 196. INDUSTRIAL LOCALIZATION. (3)**
Factors and trends in the geographic distribution of the manufacturing industries of the world, analyzed with reference to theories of industrial location.
- GEOG 197. URBAN GEOGRAPHY. (3)**
Origins of cities, followed by a study of elements of site and location with reference to cities. The patterns and functions of some major world cities will be analyzed. Theories of land use differentiation within cities will be appraised.

GEOG 198. TOPICAL INVESTIGATIONS. (1-3)

Independent study under individual guidance. Restricted to advanced undergraduate students with credit for at least 24 hours in geography, and to graduate students. Any exception should have the approval of the Head of the Department.

GEOG 199. UNDERGRADUATE RESEARCH. (3)

Directed regional or systematic study involving several subfields of geography, including cartographic presentation, and usually requiring field work; and leading to an undergraduate thesis.

*For Graduates***GEOG 200. FIELD COURSE. (3)**

Field work in September, conferences and reports during first semester. Practical experience in conducting geographic field studies. Intensive training in field methods and techniques and in the preparation of reports. For graduate students in geography. Open to other students by special permission of the Head of the Department of Geography.

GEOG 202, 203. SEMINAR IN ECONOMIC GEOGRAPHY. (3, 3)

Prerequisite, consent of instructor. An examination of themes and problems in the field of economic geography.

GEOG 204, 205. SEMINAR IN CULTURAL GEOGRAPHY. (3, 3)

Prerequisite, GEOG 126 or consent of instructor. An examination of themes and problems in the field of cultural geography.

GEOG 206, 207. SEMINAR IN PHYSICAL GEOGRAPHY.

Prerequisite, consent of instructor. An examination of themes and problems in the field of physical geography.

GEOG 210, 211. SEMINAR IN THE GEOGRAPHY OF LATIN AMERICA. (3, 3)

Prerequisite, GEOG 110, 111 or consent of instructor. An analysis of recent changes and trends in industrial development, exploitation of mineral resources, and land utilization.

GEOG 220, 221. SEMINAR IN THE GEOGRAPHY OF EUROPE AND AFRICA. (3, 3)

Prerequisite, Geog. 120 or 122, or consent of instructor. Analysis of special problems concerning the resources and development of Europe and Africa.

GEOG 230, 231. SEMINAR IN THE GEOGRAPHY OF EAST ASIA. (3, 3)

Analysis of problems concerning the geography of East Asia with emphasis on special research methods and techniques applicable to the problems of this area.

GEOG 240, 241. SEMINAR IN THE GEOGRAPHY OF THE U.S.S.R. (3, 3)

Investigation of special aspects of Soviet geography. Emphasis on the use of Soviet materials. Prerequisite, reading knowledge of Russian and GEOG 140, or consent of instructor.

GEOG 246. SEMINAR IN THE GEOGRAPHY OF THE NEAR EAST. (3)**GEOG 250. SEMINAR IN CARTOGRAPHY. (Credit arranged)**

The historical and mathematical background of cartographic concepts, practices, and problems, and the various philosophical and practical approaches to cartography. Discussions will be supplemented by the presentation of specific cartographic problems investigated by the students.



GEOG 260. ADVANCED GENERAL CLIMATOLOGY. (3)

Prerequisite, GEOG 41, or consent of instructor. Advanced study of elements and controls of the earth's climates. Principles of climatic classification. Specific analysis of certain climatic types.

GEOG 261. APPLIED CLIMATOLOGY. (3)

Prerequisite, GEOG 41, or consent of instructor. Study of principles, techniques, and data of micro-climatology, physical and regional climatology relating to such problems and fields as transportation, agriculture, industry, urban planning, human comfort and regional geographic analysis.

GEOG 262, 263. SEMINAR IN METEOROLOGY AND CLIMATOLOGY. (3, 3)

Prerequisite, consent of instructor. Selected topics in meteorology and climatology chosen to fit the individual needs of advanced students.

GEOG 280. GEOMORPHOLOGY. (3)

An advanced comparative study of selected geomorphic processes and land forms, theories of land forms evolution and geomorphological problems.

GEOG 290, 291. SELECTED TOPICS IN GEOGRAPHY. (1-3)

Readings and discussion on selected topics in the field of geography. To be taken only with joint consent of adviser and Head of the Department of Geography.

GEOG 399. DISSERTATION RESEARCH. (Credit to be arranged)

IV. GOVERNMENT AND POLITICS

The Department of Government and Politics offers programs designed to prepare students for government service, politics, foreign assignments, and intelligent and purposeful citizenship.

Business and Public Administration students may major in Government and Politics. At the Junior/Senior level they may pursue the general GVPT curriculum or they may pursue a more specialized curriculum either in International Affairs or in Public Administration.

Government and Politics majors must take a minimum of 36 semester hours in GVPT courses and may not count more than 42 hours in GVPT toward graduation. No course in which the grade is less than "C" may be counted as part of the major work.

The Government and Politics fields are as follows: (1) American Government and Politics; (2) Comparative Government; (3) International Affairs; (4) Political Theory; (5) Public Administration; (6) Public Law; and (7) Public Policy and Political Behavior.

All GVPT majors are required to take GVPT 1, 3, 20, and 141 or 142 (Political Theory). They must take one GVPT course from three separate GVPT fields as designated by the Department; and in addition: (a) GVPT majors (general) must take at least 15 GVPT semester hours at the 100 level; (b) GVPT majors taking the International Affairs curriculum must complete at least 15 semester hours at the 100 level in International Affairs and Comparative Government courses, including GVPT 101; (c) GVPT majors taking the Public Administration curriculum must complete at least 15 semester hours at the 100 level in Public Administration, including GVPT 110.

All students majoring in GVPT (general) or GVPT with specialization in Public Administration must take a minimum of 12 semester hours in one foreign language. Students majoring in GVPT with specialization in International Affairs must take a minimum of 12 semester hours in one foreign language *above the first year elementary course*. (The first year elementary requirement may be waived by high school credit or placement tests).

All students majoring in GVPT must fulfill the requirements of a minor, which involves the completion of 18 semester hours from approved Departments other than GVPT. At least six of the 18 hours must be taken at the 100 level from a single Department. Students majoring in GVPT with specialization in International Affairs may choose to take all minor courses either in geographical area studies or on a Departmental basis; geographical area minors may be chosen, with the consent of the departmental adviser, from the following: Africa, East Asia, Europe, Latin America, the Middle East, and the Soviet Union. GVPT general majors and GVPT majors specializing in Public Administration may not minor in geographical area studies.

Students who major in G. & P. may apply for admission to the G. & P. Honors Program during the second semester of their sophomore year. Additional information concerning the Honors Program may be obtained at the departmental offices.

FRESHMAN AND SOPHOMORE REQUIREMENTS³

<i>Courses</i>	<i>Hours</i>
ECON 31, 32	6
ENGL 1, 3, 4	9
Fine Arts or Philosophy	3
Foreign Language	12
(International Affairs students must have 12 foreign language credits above the first year elementary level.)	
GVPT 1, 3, 20	9
History	6
MATH 10, 11	6
Science (One Physical Science and one Biological Science)	7
Social Science (to fulfill Gen. Educ. Program requirement)	3
SPCH 1	3
	<hr/> 64

³ See catalog of College of Arts and Sciences for requirements for G. & P. majors in A. & S.

All students must meet University requirements in Physical Education and Health Education.

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. & P. GENERAL CURRICULUM

<i>Courses</i>	<i>Hours</i>
GVPT 141 or 142 (Political Theory)	3
One course from each of three GVPT fields as designated by the Department	9
Additional 100-level GVPT courses (May not all be taken in International Affairs/Comparative Government, or all in Public Administration)	15
Requirements for minor	18
Statistics	3
Electives recommended by adviser	12
	<hr/> 60

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. & P. INTERNATIONAL AFFAIRS CURRICULUM

<i>Courses</i>	<i>Hours</i>
GVPT 141 or 142 (Political Theory)	3
One course from each of three GVPT fields as designated by the Department	9
Additional 100-level International Affairs and Comparative Government courses including GVPT 101	15
Requirements for minor (Departmental or Geographical Area Studies)	18
Statistics	3
Electives recommended by adviser	12
	<hr/> 60

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. & P. PUBLIC ADMINISTRATION CURRICULUM

<i>Courses</i>	<i>Hours</i>
GVPT 141 or 142 (Political Theory)	3
One course from each of three GVPT fields as designated by the Department	9
Additional 100-level Public Administration courses including GVPT 110	15
Requirements for minor	18
Statistics	3
Electives recommended by adviser	12
	<hr/> 60

GOVERNMENT AND POLITICS

Professors: PLISCHKE, ANDERSON, BURDETTE, DILLON, HARRISON, HATHORN, AND McNELLY.

Associate Professors: BYRD, HSUEH, JACOBS, PIPER, AND ZITTA.

Assistant Professors: CHAPLES, CLAUDE, CONWAY, DEVINE, GLENDENING, KOURY, LANNING, A. LARSON, MCCARRICK, OLIVER, ONYEWU, POWELL, SPENCER, STEVENS, TERCHEK, AND WOLFE.

Lecturers: BARBER, HEISLER, H. LARSON, REEVES, SOLES, AND STAFENBERGER.

GVPT 1. AMERICAN GOVERNMENT. (3)

This course is designed as the basic course in government and it or its equivalent is a prerequisite to other courses in the Department as specified in the catalogue. It is a comprehensive study of government in the United States—national, state, and local.

GVPT 3. PRINCIPLES OF GOVERNMENT AND POLITICS. (3)

A study of the basic principles and concepts of political science. This course may be used to satisfy, in part, the Social Science requirement in the General Education Program.

GVPT 20. INTRODUCTION TO POLITICAL BEHAVIOR. (3)

Prerequisite. GVPT 1 Development, concepts, and techniques of the behavioral approach to political science. Comparison with traditional approaches.

GVPT 40. POLITICAL IDEOLOGIES. (3)

Prerequisite, GVPT 1. A survey and analysis of the leading ideologies of the modern world, including anarchism, communism, socialism, fascism, nationalism, and democracy.

GVPT 60. STATE AND LOCAL GOVERNMENT. (3)

Prerequisite, GVPT 1. A study of the functioning and problems of state and local government in the United States, with illustrations from Maryland jurisdictions.

GVPT 97. GOVERNMENTS AND POLITICS OF EUROPE. (3)

Prerequisite, GVPT 1. A comparative study of the political system of the United Kingdom, France, Germany, Italy, and other selected European countries.

For Graduates and Advanced Undergraduates

GVPT 101. INTERNATIONAL POLITICAL RELATIONS. (3)

A study of the major factors underlying international relations, the methods of conducting foreign relations, the foreign policies of the major powers, and the means of avoiding or alleviating international conflicts. This course may be used to satisfy, in part, the Social Science requirement in the General Education Program.

GVPT 102. INTERNATIONAL LAW. (3)

Prerequisite, GVPT 1. A study of the basic character, general principles, and specific rules of international law, with emphasis on recent and contemporary trends in the field and its relation to other aspects of international affairs.

GVPT 103. CONTEMPORARY AFRICAN POLITICS. (3)

Prerequisite, GVPT 1. A survey of contemporary development in the international politics of Africa, with special emphasis on the role of an emerging Africa in world affairs.

GVPT 104. INTER-AMERICAN RELATIONS. (3)

Prerequisite, GVPT 1. An analytical and historical study of the Latin-American policies of the United States and of problems in our relations with individual countries, with emphasis on recent developments.

GVPT 105. RECENT FAR EASTERN POLITICS. (3)

Prerequisite, GVPT 1. The background and interpretation of recent political events in the Far East and their influence on world politics.

GVPT 106. AMERICAN FOREIGN RELATIONS. (3)

Prerequisite, GVPT 1. The principles and machinery of the conduct of American foreign relations, with emphasis on the Department of State and the Foreign Service, and an analysis of the major foreign policies of the United States.

GVPT 107. CONTEMPORARY MIDDLE EASTERN POLITICS. (3)

Prerequisite, GVPT 1. A survey of contemporary development in the international politics of the Middle East, with special emphasis on the role of emerging Middle East nations in world affairs.

GVPT 108. INTERNATIONAL ORGANIZATION. (3)

Prerequisite, GVPT 1. A study of the objectives, structure, functions, and procedures of international organizations, including the United Nations and such functional and regional organizations as the Organization of American States.

GVPT 109. FOREIGN POLICY OF THE U.S.S.R. (3)

Prerequisite, GVPT 1. A study of the development of the foreign policy of the Soviet Union, with attention paid to the forces and conditions that make for continuities and changes from Tsarist policies.

GVPT 110. PRINCIPLES OF PUBLIC ADMINISTRATION. (3)

Prerequisite, GVPT 1. A study of public administration in the United States giving special attention to the principles of organization and management and to fiscal, personnel, planning, and public relations practices.

GVPT 111. PUBLIC PERSONNEL ADMINISTRATION. (3)

Prerequisite, GVPT 110 or BSAD 160. A survey of public personnel administration, including the development of merit civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee relations, and retirement.

GVPT 112. PUBLIC FINANCIAL ADMINISTRATION. (3)

Prerequisite, GVPT 110 or ECON 142. A survey of governmental financial procedures, including processes of current and capital budgeting, the administration of public borrowing, the techniques of public purchasing, and the machinery of control through pre-audit and post-audit.

GVPT 113. GOVERNMENTAL ORGANIZATION AND MANAGEMENT. (3)

Prerequisite, GVPT 110. A study of the theories of organization and management in American government with emphasis on new trends, experiments, and reorganizations.

GVPT 120. PROBLEMS IN POLITICAL BEHAVIOR. (3)

Prerequisite, GVPT 1. The problem approach to political behavior with emphasis on theoretical and empirical studies on selected aspects of the political process.

GVPT 124. LEGISLATURES AND LEGISLATION. (3)

Prerequisite, GVPT 1. A comprehensive study of legislative organization, procedure, and problems. The course includes opportunities for student contact with Congress and with the Legislature of Maryland.

GVPT 131. INTRODUCTION TO CONSTITUTIONAL LAW. (3)

Prerequisite, GVPT 1. A systematic inquiry into the general principles of the American constitutional system, with special reference to the role of the judiciary in the interpretation and enforcement of the federal constitution.

GVPT 132. CIVIL RIGHTS AND THE CONSTITUTION. (3)

Prerequisite, GVPT 131. A study of civil rights in the American constitutional context, emphasizing freedom of religion, freedom of expression, minority discrimination, and the rights of defendants.

GVPT 133. THE JUDICIAL PROCESS. (3)

Prerequisite, GVPT 1. An examination of judicial organization in the United States at all levels of government, with some emphasis on legal reasoning, legal research, and court procedures.

GVPT 141. HISTORY OF POLITICAL THEORY. (3)

Prerequisite, GVPT 1. A survey of the principal political theories set forth in the works of writers from Plato to Bentham.

GVPT 142. RECENT POLITICAL THEORY. (3)

Prerequisite, GVPT 1. A study of 19th and 20th century political thought, with special emphasis on recent theories of socialism, communism, and fascism.

GVPT 144. AMERICAN POLITICAL THEORY. (3)

Prerequisite, GVPT 1. A study of the development and growth of American political concepts from the colonial period to the present.

GVPT 145. RUSSIAN POLITICAL THOUGHT. (3)

Prerequisite, GVPT 1. A survey and analysis of political ideas in Russia and the Soviet Union from early times to the present.

GVPT 150H. HONORS SEMINAR IN AMERICAN GOVERNMENT AND PUBLIC ADMINISTRATION. (3)

Prerequisite, admission to Honors Program. Directed reading, reporting, and discussion on the major materials of historical and contemporary relevance in the fields of American government and public administration.

GVPT 151H. HONORS SEMINAR IN COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS. (3)

Prerequisite, admission to Honors Program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of comparative government and international relations.

GVPT 152H. HONORS SEMINAR IN PUBLIC LAW AND POLITICAL THEORY. (3)

Prerequisite, admission to Honors Program. Directed reading, reporting, and discussion centering on the major materials of historical and contemporary relevance in the fields of public law and political theory.

GVPT 153H. HONORS SEMINAR IN PUBLIC POLICY AND POLITICAL BEHAVIOR (AND METHODOLOGY). (3)

Prerequisite, admission to Honors Program. Directed reading, reporting, and discussion centering on the major materials of historical and contemporary relevance in the fields of public policy and political behavior.

GVPT 154. PROBLEMS OF WORLD POLITICS. (3)

Prerequisite, GVPT 1. A study of governmental problems of international scope, such as causes of war, problems of neutrality, and propaganda. Students are required to report on readings from current literature.

GVPT 155H. HONORS RESEARCH. (3, 3)

Prerequisite, admission to Honors Program. Individual reading and research. In his last semester each student prepares an original research paper.

GVPT 156H. CURRENT LITERATURE IN GOVERNMENT AND POLITICS. (1, 1, 1, 1)

Each student is assigned designated journals in consultation with the instructor. He prepares and distributes to his colleagues abstracts of selected articles, answers questions on the abstracts, and reports orally, in turn, on one or more articles of his choice.

GVPT 160. STATE AND LOCAL ADMINISTRATION. (3)

Prerequisite, GVPT 1. A study of the administrative structure, procedures, and policies of state and local governments with special emphasis on the state level and on intergovernmental relationships, and with illustrations from Maryland governmental arrangements.

GVPT 161. METROPOLITAN ADMINISTRATION. (3)

Prerequisite, GVPT 1. An examination of administrative problems relating to public services, planning, and coordination in a metropolitan environment.

GVPT 171. PROBLEMS OF AMERICAN PUBLIC POLICY. (3)

Prerequisite, GVPT 1. The background and interpretation of various factors which affect the formation and execution of American public policy.

GVPT 174. POLITICAL PARTIES. (3)

Prerequisite, GVPT 1. A descriptive and analytical examination of American political parties, nominations, elections, and political leadership.

GVPT 178. PUBLIC OPINION. (3)

Prerequisite, GVPT 1. An examination of public opinion and its effect on political action, with emphasis on opinion formation and measurement, propaganda, and pressure groups.

GVPT 181. ADMINISTRATIVE LAW. (3)

Prerequisite, GVPT 1. A study of the discretion exercised by administrative agencies, including analysis of their functions, their powers over persons and property, their procedures, and judicial sanctions and controls.

GVPT 191. GOVERNMENT AND ADMINISTRATION OF THE SOVIET UNION. (3)

Prerequisite, GVPT 1. A study of the adoption of the communist philosophy by the Soviet Union, of its governmental structure, and of the administration of government policy in the Soviet Union.

GVPT 192. GOVERNMENT AND POLITICS OF LATIN AMERICA. (3)

Prerequisite, GVPT 1. A comparative study of the governmental systems and political processes of the Latin American countries, with special emphasis on Argentina, Brazil, Chile, and Mexico.

GVPT 193. GOVERNMENT AND POLITICS OF ASIA. (3)

Prerequisite, GVPT 97. or GVPT 105. or HIST 61. or HIST 62. or HIST 187. or HIST 188. or HIST 189. A comparative study of the political systems of China, Japan, India, and other selected Asian countries.

GVPT 194. GOVERNMENT AND POLITICS OF AFRICA. (3)

Prerequisite, GVPT 1. A comparative study of the governmental systems and political processes of the African countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 195. GOVERNMENT AND POLITICS OF THE MIDDLE EAST. (3)

Prerequisite, GVPT 1. A comparative study of the governmental systems and political processes of the Middle Eastern countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 197. COMPARATIVE POLITICS SYSTEMS. (3)

Prerequisite, GVPT 97 and at least one other course in comparative government. A study, along functional lines, of major political institutions, such as legislatures, executives, courts, bureaucracies, public organizations, and political parties.

*For Graduates***GVPT 200. SEMINAR IN NATIONAL SECURITY POLICY. (3)**

An examination of the components of United States security policy. Factors, both internal and external, affecting national security will be considered. Individual reporting as assigned.

GVPT 201. SEMINAR IN INTERNATIONAL POLITICAL ORGANIZATION. (3)

A study of the forms and functions of various international organizations.

GVPT 202. SEMINAR IN INTERNATIONAL LAW. (3)

Reports on selected topics assigned for individual study and reading in substantive and procedural international law.

GVPT 203. FUNCTIONAL PROBLEMS IN INTERNATIONAL RELATIONS. (3)

An examination of the major substantive issues in contemporary international relations, involving reports on selected topics based on individual research.

GVPT 204. AREA PROBLEMS IN INTERNATIONAL RELATIONS. (3)

An examination of problems in the relations of states within a particular geographic area, such as Europe, Asia and the Far East, Africa and the Middle East, and the Western Hemisphere. Individual reporting as assigned.

GVPT 205. SEMINAR IN AMERICAN POLITICAL INSTITUTIONS. (3)

Reports on topics assigned for individual study and reading in the background and development of American government.

GVPT 206. SEMINAR IN AMERICAN FOREIGN RELATIONS. (3)

Reports on selected topics assigned for individual study and reading in American foreign policy and the conduct of American foreign relations.

GVPT 207. SEMINAR IN COMPARATIVE GOVERNMENTAL INSTITUTIONS. (3)

Reports on selected topics assigned for individual study and reading in governmental and political institutions in governments throughout the world.

GVPT 208. SEMINAR IN THE GOVERNMENT AND POLITICS OF EMERGING NATIONS. (3)

An examination of the programs of political development in the emerging nations, with special reference to the newly independent nations of Asia and Africa and the less developed countries of Latin America. Individual reporting as assigned.

GVPT 209. SEMINAR IN INTERNATIONAL ADMINISTRATION. (3)

An analysis of the administrative aspects of international organizations, with some attention given to program administration.

GVPT 211. SEMINAR IN FEDERAL-STATE RELATIONS. (3)

Reports on topics assigned for individual study and reading in the field of recent federal-state relations.

GVPT 213. PROBLEMS OF PUBLIC ADMINISTRATION. (3)

Reports on topics assigned for individual study and reading in the field of public administration.

GVPT 214. PROBLEMS OF PUBLIC PERSONNEL ADMINISTRATION. (3)

Reports on topics assigned for individual study and reading in the field of public personnel administration

GVPT 215. PROBLEMS OF STATE AND LOCAL GOVERNMENT. (3)

Reports on topics assigned for individual study in the field of state and local government throughout the United States.

GVPT 216. GOVERNMENT ADMINISTRATIVE PLANNING AND MANAGEMENT. (3)

Reports on topics assigned for individual study and reading in administrative planning and management in government.

GVPT 218. SEMINAR IN URBAN ADMINISTRATION. (3)

Selected topics are examined by the team research method with students responsible for planning, field investigation, and report writing.

GVPT 221. SEMINAR IN PUBLIC OPINION. (3)

Reports on topics assigned for individual study and reading in the field of public opinion.

GVPT 223. SEMINAR IN LEGISLATURES AND LEGISLATION. (3)

Reports on topics assigned for individual study and reading about the composition and organization of legislatures and about the legislative process.

GVPT 224. SEMINAR IN POLITICAL PARTIES AND POLITICS. (3)

Reports on topics assigned for individual study and reading in the fields of political organization and action.

GVPT 225. MAN AND THE STATE. (3)

Prerequisite, GVPT 142. Individual reading and reports on such recurring concepts in political theory as liberty, equality, justice, natural law and natural rights, private property, sovereignty, nationalism and the organic state.

GVPT 226. SCOPE AND METHOD OF POLITICAL SCIENCE. (3)

Required of all Ph.D. candidates. A seminar in the methodologies of political science, and their respective applications to different research fields. Inter-disciplinary approaches and bibliographical techniques are also reviewed.

GVPT 227. ANALYTICAL SYSTEMS AND THEORY CONSTRUCTION. (3)

Prerequisite, GVPT 226. Examination of the general theoretical tools available to political scientists and of the problems of theory building. Attention is given to communications theory, decision-making, game theory and other mathematical concepts, personality theory, role theory, structural-functional analysis, and current behavioral approaches.

GVPT 231. SEMINAR IN PUBLIC LAW. (3)

Reports on topics assigned for individual study and reading in the fields of constitutional and administrative law.

- GVPT 261. PROBLEMS IN AMERICAN GOVERNMENT AND POLITICS. (3)
An examination of contemporary problems in various fields of government and politics in the United States, with reports on topics assigned for individual study.
- GVPT 399. THESIS RESEARCH. (Arranged)

V. INFORMATION SYSTEMS MANAGEMENT

The program of studies in information systems management is designed to meet the needs of those wishing to concentrate on the application of the digital computer to the analysis, design, and administration of complex information systems. Students who expect to enter business administration, public administration, or organizations in other fields will find that this program offers a relevant preparation.

The student entering this program will place emphasis on the study of digital computer applications and relevant mathematical methods. With the aid of a faculty adviser, he will select a minimum of 15 hours of course work in a secondary field such as Business Administration, Computer Science, Economics, Mathematics, Psychology, Public Administration, or the Sciences.

INFORMATION SYSTEMS MANAGEMENT CURRICULUM

	<i>(Semester)</i>	
<i>Freshman Year</i>		
ENGL 001—Composition and American Literature	3	..
ENGL 003—Composition and World Literature . . . . .	..	3
MATH 019, 020—Analysis I, II	4	4
SPCH 001—Public Speaking	3	..
Natural Science (one biological and one physical)	3-4	3-4
Fine Arts and Philosophy Elective . . . . .	..	3
Physical Activities (Men and Women) . . . . .	..	1
HLTH 005—Science and Theory of Health . . . . .	..	2
Elective	3	..
	16-17	16-17
<i>Sophomore Year</i>		
BSAD 020, 021—Principles of Accounting	3	3
ECON 031, 032—Principles of Economics	3	3
History	3	3
ENGL 004—Composition and World Literature	3	..
PSYC 001—Introduction to Psychology . . . . .	..	3
CMSC 012 or 020—Introductory Algorithmic Methods or Elementary Algorithmic Analysis . . . . .	..	3
Physical Activities	1	..
Elective	3	..
	16	15

Junior Year

ISM 101—Electronic Data Processing	3	..
ISM 102—Electronic Data Processing Applications .....	..	3
ISM 167—Operations Research I .....	..	3
BSAD 130, 131—Business Statistics I, II	3	3
BSAD 135—Statistical Analysis and Forecasting .....	..	3
ECON 102—National Income Analysis	3	..
ECON 132—Intermediate Price Theory .....	..	3
Electives	6	
	<hr/>	<hr/>
	15	15

Senior Year

ISM 103—Introduction to Systems Analysis	3	..
ISM 110—Information Processing Problems of Models of Administrative, Economic and Political Systems	3	..
ISM 120—Information Processing and Computational Problems in Operations Analysis .....	..	3
BSAD 134—Statistical Quality Control	3	..
Electives	6	12
	<hr/>	<hr/>
	15	15

INFORMATION SYSTEMS MANAGEMENT

Professor: PATRICK.

Assistant Professor: SPRAGUE.

Instructors: AKMAN, CHAPPELL, HARTNESS.

Lecturer: GOLDING.

ISM 101. ELECTRONIC DATA PROCESSING. (3)

Prerequisite, junior standing, MATH 11 or the equivalent. The electronic digital computer and its use as a tool in processing data. The course includes the following areas: (1) Organization of data processing systems, (3) environmental aspects of computer systems, (3) fundamentals of programming using a common problem-oriented language, and (4) management control problems and potentials inherent in mechanized data processing systems.

ISM 102. ELECTRONIC DATA PROCESSING APPLICATIONS. (3)

Prerequisite, ISM 101 and BSAD 130, or consent of instructor. Intensive study of computer applications using a problem-oriented language. Introduction of computer methods for the solution of organizational problems. Laboratory exercises in programming and development of computer techniques.

ISM 103. INTRODUCTION TO SYSTEMS ANALYSIS. (3)

Prerequisite, ISM 102, BSAD 131, MATH 20, or the equivalent. Prerequisites may be waived with consent of instructor. The use of the computer in the management and operation of organizations. The course includes the following areas: (1) the principles of systems analysis, (2) recent applications and innovations of the systems concept, (3) design and implementation of computer systems, including such techniques as mathematical programming, simulation, business games and network analysis, and (4) laboratory use of a digital computer in the application of these techniques.

ISM 110. INFORMATION PROCESSING PROBLEMS OF MODELS OF ADMINISTRATIVE, ECONOMIC AND POLITICAL SYSTEMS. (3)

Prerequisites, MATH 20 or equivalent; ISM 102, BSAD 130, and some familiarity with administrative, economic and/or political models. Prerequisites may be waived with the consent of instructor. Data processing requirements underlying the creation and maintenance of a data base to be used in estimating the parameters of socio-economic models. An analysis of the structure and development of recent socio-economic models as relevant to data processing considerations. Extractions and preparation of data from the data base to facilitate the appropriate transformation necessary for model construction and also to minimize the processing cost of data input. The course draws upon a knowledge of models of administrative, economic and political systems. Case studies and experience with data processing for selected models are included.

ISM 120. INFORMATION PROCESSING AND COMPUTATIONAL PROBLEMS IN OPERATIONS ANALYSIS. (3)

Prerequisite, MATH 20 or equivalent; ISM 102, and a course in Statistics, such as BSAD 135, dealing with multivariate models. Prerequisites may be waived with the consent of the instructor. Implementation of applications requiring the integration of data processing and analytical programming techniques. Such applications feature the calculation of various statistical estimates of the parameters in a multivariate model within the context of a file maintenance problem (e.g., the writing of a matrix inversion routine for revenue forecasting within a master updating program or sales forecasting and/or sales performance evaluation within a sales transaction—master updating program). A universal, problem-oriented language such as COBAL will be used with strong emphasis on the use of the mathematical FORT IV library subroutines. Class projects include case studies and solutions of problems using real-world data.

ISM 167. OPERATIONS RESEARCH I. (3)

To meet this course requirement, all students enrolled in the Information Systems Management Curriculum will register in BSAD 167. For detailed information on prerequisites and description of the course refer to BSAD 167.

*For Graduates***ISM 210. DESIGN OF LARGE-SCALE INFORMATION PROCESSING SYSTEMS. (3)**

Prerequisites, ISM 103 and 110, or consent of instructor. Characteristics of large-scale information processing systems. Relationship of model-building and simulation to information processing system design. Design elements and phases. Programming techniques for large-scale information processing systems, including time sharing and real-time. Cases and the design of a large-scale information processing system will be studied.

ISM 220. MANAGEMENT OF INFORMATION PROCESSING SYSTEMS. (3)

Prerequisite, ISM 103 or consent of instructor. Administrative uses and limitations of high-speed computers in an information processing system. Limitations as related to system structure and methods used to originate and process data. Planning and installation of a total information processing system including conversion problems. Measures of information processing effectiveness. Documentation procedures. Data security, legal considerations and auditing the information processing system. Personnel requirements for an on-going system. The broad statement of the system requirements is taken as given.

ISM 230. APPLICATION OF ADVANCED DEVELOPMENTS IN INFORMATION PROCESSING EQUIPMENT. (3)

Prerequisite, ISM 210 or consent of instructor. A study and an evaluation of the operational and hardware characteristics of the computer and peripheral equipment available to meet the specification of the broad classes of information processing systems, including coding systems, error-detecting and software considerations. Data communicating devices, including the functional characteristics of longline, telephone channel, transceiver and communication satellites. Case studies and examples.

VI. JOURNALISM

The first objective of the Department of Journalism is to provide a four-year liberal education for the student of superior writing ability who intends to make a career in some phase of journalism. It also serves the major within the department whose career intention may be in a field related to journalism.

The department's curriculum in news editorial journalism has been accredited by the American Council on Education for Journalism. The department is a member of the American Association of Schools and Departments of Journalism and of the American Society of Journalism School Administrators.

Particular features of the curriculum are (1) a two-year introductory program of general education, centered in the liberal arts, (2) a required core program, equivalent to approximately one semester, in basic aspects of journalism, (3) specialization beyond the core in news-editorial work, photojournalism, public relations, radio-television work, or advertising, (4) the equivalent of approximately one semester of upper-division study in a subject chosen from outside the Department of Journalism, (5) elective courses and (6) opportunities for field contacts.

The student may declare his intention to major in the Department of Journalism at the beginning of any semester, but normally before the junior year. His choices of specialization within the department and of related study in other departments should be made by the beginning of the junior year and after consultation with a faculty adviser.

An average grade of "C" or better in courses taken in the department is required of journalism majors for graduation.

Majors are urged and helped to write for publication and to obtain professional experience between the junior and senior years on the job or in summer internships. The department maintains close working relations with professional journalists, public relations practitioners and their organizations. One of the purposes is to provide speakers, trips, laboratories, internships and other types of supervised professional training for students.

An essential part of the work in editorial journalism consists of supervised training on the Baltimore Sun or the Baltimore News-American and nearby weekly papers. The experience may also be obtained on other publications, approved by the adviser. This professional training helps students to become familiar with reporting, editing and advertising for professional publications covering Maryland and Capital Hill in Washington, D. C.

Listed below are the lower-division and the upper-division requirements for majors in the Department of Journalism. In qualifying for the degree, the student must complete 120 semester hours, 57 hours of which must be upper-

division credit. The exceptions to the upper-division rule are noted on page.3 of this catalog.

Course substitutions may be made by the faculty adviser to take account of previous professional experience and to develop programs to include special study. Within the broad outlines of the upper-division courses themselves, students art encouraged to develop individual interests by careful choice of elective courses.

LOWER-DIVISION CURRICULUM

<i>Freshman Year</i>	<i>Semester</i>	
	<i>I</i>	<i>II</i>
ENGL 1 (or 21), 3—Composition and American Literature	3	3
Science (one course of which must be a lab science)	4	3
Foreign language (or BSAD 10, ECON 4)	3	3
PSYC 1 and/or SOCY 1—(prerequisites to Foreign Lan. alt.)	3	
GVPT 1—Introduction to Government and Politics		3
SPCH 1—Public Speaking	3	
MATH 10—Introduction to Mathematics		3
HLTH 5—Science and Theory of Health		2
Physical Activities	1	1
Total	17	18
<i>Sophomore Year</i>		
JOUR 10—Introduction to Journalism	3	..
ENGL 4—Composition and World Literature	3	3
Foreign language (or PSYC 21, SOCY 52)	3	3
History	3	3
ECON 31, 32—Principles of Economics	3	3
Elective from PHIL 1 (or 41 or 45 or 53), ART 10 (or 60, 61, 80), SPCH 16, MUSC 20 .....	..	3
Total	15	15

UPPER-DIVISION CURRICULUM

The core program:

JOUR 100—News Reporting	3
JOUR 160—News Editing	3
JOUR 191—Law of the Press	3
JOUR 192—History of American Journalism	3

Professional specialization:

9 credit hours in upper-division courses in one of the following fields:

- Advertising
- News-editorial
- Photojournalism
- Public Relations
- Radio-television

Electives in Department of Journalism

6

Non-Journalism requirements:

12-18 credit hours in upper-division courses in one subject outside of the Journalism Department	12 - 18
15 credit hours of upper-division, non-journalism courses, to be spread or concentrated according to individual needs	15
	<hr/>
	27 - 33
TOTAL UPPER-DIVISION	<hr/>
	54 - 60

JOURNALISM

Professors: HIEBERT, BRYAN, CROWELL, NEWSOM.

Associate Professor: VINOCOUR.

Assistant Professor: NOALL.

Lecturers: GERACI, HOGAN, WESCHKE.

JOUR 10. INTRODUCTION TO JOURNALISM. (3)

Prerequisites, at least average grade of C in ENGL 1 and 2 or 21; ability to type at least 40 words per minute. Survey of journalism, professional careers in writing and communications, news writing in laboratory.

JOUR 100. NEWS REPORTING. (3)

Prerequisite, JOUR 10. News reporting, campus news beat in laboratory.

JOUR 101. RADIO NEWS REPORTING. (2)

Theory and practice in radio news reporting.

JOUR 152. ADVERTISING COPY AND LAYOUT. (3)

Theory and practice in advertising copy and layout, with emphasis on newspaper advertising, for letterpress and photo-offset printing. Use of illustrations, type selection, copy-fitting, media selection.

JOUR 160. NEWS EDITING. (3)

Copy editing, headline writing, newspaper page layout.

JOUR 161. ADVANCED EDITING. (3)

Prerequisite, JOUR 160, consent of instructor. Includes one afternoon a week of supervised work on Baltimore Sun or Baltimore News-American desk, arranged. Headline writing, rewriting, copy editing, makeup. A seminar for Journalism seniors in newsroom problems and policies emphasizing ethics and responsibilities.

JOUR 163. NEWSPAPER TYPOGRAPHY. (3)

Introduction to newspaper typography, printing and reproduction processes, type recognition, uses and harmony, principles of good typography.

JOUR 165. FEATURE WRITING. (3)

Writing and selling of newspaper and magazine articles.

JOUR 166. PUBLIC RELATIONS. (3)

Survey of public relations, principles, general orientation.

JOUR 170. PUBLICITY TECHNIQUES. (3)

Prerequisite, JOUR 166. Strategy and techniques of publicity operations. Practice in use of major media of public communication; off-campus publicity projects.

JOUR 171. INDUSTRIAL JOURNALISM. (3)

Industrial communications, management and production of company periodicals, public relations aspects of industrial journalism.

JOUR 173. SCHOLASTIC JOURNALISM. (3)

Introduction to theory and practice in production of high school publications, for scholastic publications advisers.

JOUR 175. ADVANCED REPORTING. (3)

Prerequisite, JOUR 160, consent of instructor. Includes one weekday morning on regular beat for Baltimore Sun, Baltimore News-American or weekly newspaper; supervised, professional reporting on city, county, federal beats.

JOUR 176. THE PRESS AND WORLD SOCIETIES. (3)

Survey of history and status of news press throughout the world, role of the press in various societies, responsibilities of the press.

JOUR 181. PRESS PHOTOGRAPHY. (3)

Prerequisite, JOUR 10 or equivalent. Introduction to fundamentals of shooting, developing, printing of news and feature pictures. Equipment furnished by the department. Student furnishes own supplies.

JOUR 182. ADVANCED PRESS PHOTOGRAPHY. (3)

Prerequisite, JOUR 181. Use of the small camera in photojournalism. Emphasis on the picture story. Student furnishes his own supplies.

JOUR 184. PHOTO COMMUNICATIONS. (3)

Theory and practice in uses of photojournalism. Analysis of the role of pictures in newspapers, magazines and related media.

JOUR 186. PUBLIC RELATIONS OF GOVERNMENT. (3)

Prerequisite, JOUR 166. Study of public relations programs, publicity, propaganda, information services in local, national and foreign governments and international organizations.

JOUR 191. LAW OF THE PRESS. (3)

Non-legal introduction to libel, privacy, copyright, contempt, and other legal problems confronting journalists.

JOUR 192. HISTORY OF AMERICAN JOURNALISM. (3)

History of American journalism and its influences on political, social and cultural institutions.

JOUR 194. PUBLIC RELATIONS CASES AND RESEARCH. (3)

Prerequisites, JOUR 166 and BSAD 130 or equivalent. Study of current cases in public relations, policy formulation, strategy, ethics. Computer science center oriented field research.

JOUR 196. PROBLEMS IN JOURNALISM. (1 or 2)

Group and individual projects in problems in journalism.

JOUR 197S. SUPERVISED INTERNSHIP. (0)

Summer session. To be taken following junior year as major in this department, permission of instructor. Ten weeks of organized, supervised study, experience, on-the-job training to journalism.

VII. BUREAU OF BUSINESS AND ECONOMIC RESEARCH

The responsibilities of the Bureau of Business and Economic Research are research, training and public service.

The research activities of the Bureau are primarily focused on basic research in the field of regional economic development. Although the Bureau's long-run research program is carried out largely by its own staff of faculty members, faculty members from other departments also participate. The Bureau also undertakes co-operative research contracts under the sponsorship of federal and state governmental agencies, research foundations and other groups.

The training functions of the Bureau are achieved through active participation by advanced graduate and undergraduate students in the Bureau's research program. This direct involvement of students in the research process under faculty supervision provides research skills that equip students for responsible posts in business, government and higher education.

The Bureau observes its service responsibilities to government, business, and private groups primarily through the publication and distribution of its research findings. In addition, the Bureau staff welcomes the opportunity to be of service to governmental, business, and private groups by consulting with them on problems in business and economics, particularly those related to regional development.

VIII. BUREAU OF GOVERNMENTAL RESEARCH

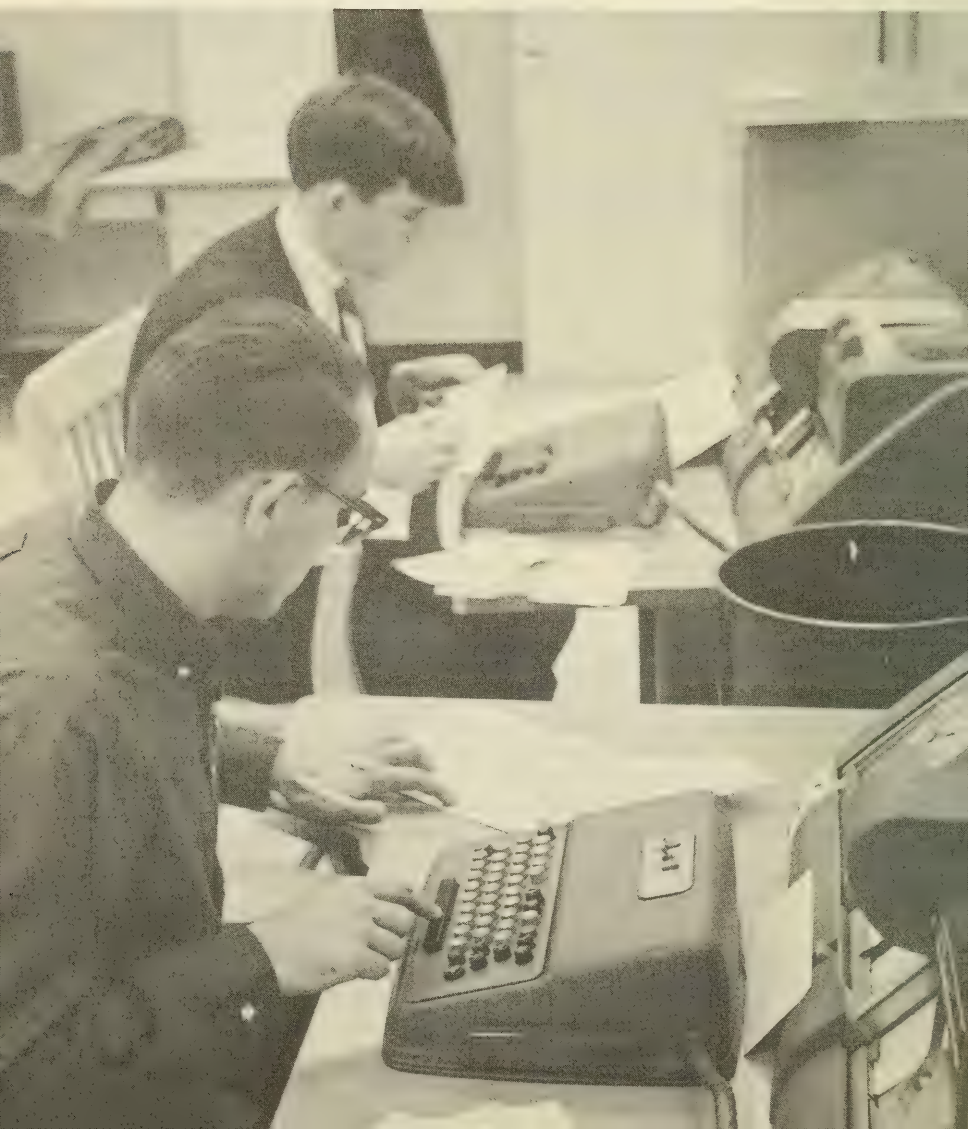
Activities of the Bureau of Governmental Research relate primarily to the problems of state and local government in Maryland. The Bureau engages in research and publishes findings with reference to local, state and national governments and their interrelationships. It undertakes surveys and offers its assistance and service to units of government in Maryland and serves as a clearing house of information for them. The Bureau furnishes opportunities for qualified students interested in research and career development in state and local administration.

The Maryland Technical Advisory Service, a division of the Bureau, provides consulting services to county and municipal governments of the State. Technical consultation and assistance are provided on specific problems in such areas as regulatory or other drafting and codification, fiscal management, personnel management, utility and other service operations, planning and zoning, and related local or intergovernmental activities. The staff analyzes and shares with governmental officials information concerning professional developments and opportunities for new or improved programs and facilities.

IX. AFFILIATED GOVERNMENTAL ORGANIZATION

MARYLAND MUNICIPAL LEAGUE

The office of the Maryland Municipal League, an organization of Maryland cities, is located in the College of Business and Public Administration. The League provides opportunities for association to municipal officials, offers services to city governments and organizes legislative programs affecting municipal affairs. It publishes monthly the *Maryland Municipal News*. The League's mailing address is Maryland Municipal League, Box 276, College Park, Maryland 20742.



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SUMMER SCHOOL, 1968

JUNE	24-25	Monday-Tuesday	Summer School Registration
	26	Wednesday	Instruction begins
JULY	4	Thursday	Independence Day, holiday
	6	Saturday	Classes (Thursday schedule)
AUGUST	16	Friday	Summer School ends

SHORT COURSES, 1968

JUNE	17-21	Monday-Friday	College Week for Women
AUGUST	5-9	Monday-Friday	4-H Club Week
SEPTEMBER	3-6	Tuesday-Friday	Firemen's Short Course

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m. Christmas recess ends
	15	Wednesday	After last class—end of instruction
	17-24	Friday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
APRIL	3	Thursday	After last class—Spring recess begins
	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
	23-25	Monday-Wednesday	State Vocational Agriculture Teachers Conference
AUGUST	5-8	Tuesday-Friday	Maryland 4-H Conference
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

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ADJUNCT COMMITTEE: BALTIMORE CITY CAMPUS STUDENT AFFAIRS

THE FUTURE OF THE UNIVERSITY



VERNON E. ANDERSON, PH.D., DEAN

The College of Education

THE COLLEGE OF EDUCATION MEETS THE NEEDS OF THE FOLLOWING CLASSES of students: (1) persons preparing to teach in colleges, secondary schools, elementary schools, kindergarten, and nursery schools; (2) persons preparing to teach classes in special education and to be school librarians; (3) present or prospective teachers who wish to supplement their preparation; (4) students preparing for educational work in the trades and industries; (5) graduate students preparing for teaching, supervisory, or administrative positions; (6) certain students whose major interests are in other fields, but who desire courses in education.

Because of the location of the University in the suburbs of the nation's capital, unusual facilities for the study of education are available to its students and faculty. The Library of Congress, the library of the United States Office of Education, and special libraries of other government agencies are accessible, as well as the information services of the National Education Association, American Council on Education, United States Office of Education, and other organizations, public and private. The school systems of the District of Columbia, Baltimore, and the counties of Maryland offer generous cooperation.

The teacher education programs preparing early childhood, elementary school, and secondary school teachers at the Bachelor's degree and Master's degree levels, and the programs preparing school service personnel (elementary and secondary school principals, general school administrators, supervisors, curriculum coordinators, guidance counselors, student personnel administrators, and vocational rehabilitation counselors) at the Master's Advanced Graduate Specialist, and Doctoral degree levels are all fully accredited by the National Council for Accreditation of Teacher Education.

Organization

The College is organized into six departments, an institute, and other non-departmental areas. These offer a wide range of programs in teacher education or education specialties.

DEPARTMENT OF EARLY CHILDHOOD-ELEMENTARY EDUCATION

This department offers programs to prepare teachers for nursery school, kindergarten, and for all grades in the elementary school.

DEPARTMENT OF SECONDARY EDUCATION

This department is concerned with the preparation of teachers for junior and senior high schools. Teaching majors are offered in the following areas: art, business, dance, English, foreign languages, home economics, mathematics, music, science, social studies, and speech. Majors in physical education and agriculture are offered in the College of Physical Education, Recreation, and Health and the College of Agriculture in cooperation with the College of Education.

DEPARTMENT OF INDUSTRIAL EDUCATION

This department offers programs leading to teacher certification in Industrial Arts and Vocational-Industrial Education. It also offers a program in Education for Industry which prepares individuals for supervisor and industrial management positions, and an Industrial Technology program for persons with advanced technical preparation who wish to teach in technical institutes or junior colleges.

INSTITUTE FOR CHILD STUDY

This institute carries on the following activities: (1) it undertakes basic research in human development; (2) it digests and synthesizes research findings from the many sciences that study human beings; (3) it plans, organizes, and provides consultant service programs of direct child study by in-service teachers in individual schools or in municipal, county or state systems; (4) it offers field training to a limited number of properly qualified doctoral students, preparing them to render expert consultant service to schools and for college teaching of human development. The College of Education operates Workshops in Child Development and Education for six weeks each summer. Inquiries should be addressed to Director, Institute for Child Study.

DEPARTMENT OF ADMINISTRATION, SUPERVISION AND CURRICULUM

The programs in Administration, Supervision and Curriculum are all at the graduate level and include preparation of school superintendents, principals, supervisors, curriculum directors, and administrative specialists in the areas of finance and business administration, personnel administration, public relations, and educational facilities. In addition, there are programs for the preparation of professors and research workers in all of the above areas. Preparation programs leading to administrative positions in junior colleges and other institutions of higher learning are available through a joint major in Administration-Higher Education.

DEPARTMENT OF COUNSELING AND PERSONNEL SERVICES

Programs of preparation are offered by this department at the master's degree, advanced graduate specialist, and doctoral degree levels for counselors in elementary and secondary schools, rehabilitation agencies, community agencies, college and university counseling centers. It also offers programs of preparation for other personnel services: college student personnel administration, visiting teacher, and psychological services in schools.

DEPARTMENT OF SPECIAL EDUCATION

This department offers programs for the preparation of personnel to work in instructional programs for exceptional children at all levels.

NON-DEPARTMENTAL AREAS

These offer programs which prepare students for certification, or offer service for graduate majors. Included are school librarianship; history, philosophy and sociology of education and comparative education (social foundations of education); research design, statistics and measurement; and higher education.

Facilities

The College is housed in two buildings. All departments and special areas with the exception of Industrial Education have their offices and instructional

facilities in the new College of Education Building. This building was planned with the special needs of teacher education in mind. It was built in 1965 and the basement was completed in 1967. The Industrial Education Department is housed in the J. Milton Patterson Building. The facilities of this building are devoted exclusively to the work of the Department.

Special Services

The College provides several kinds of special services for faculty and students, and schools and teachers in the field:

BUREAU OF EDUCATIONAL RESEARCH AND FIELD SERVICES

The Bureau of Educational Research and Field Services has been established to (1) encourage and stimulate basic research bearing on different aspects of the educative process; (2) provide assistance in designing, implementing and evaluating research projects initiated by local school systems; (3) coordinate school systems' requests for consultants with the rich and varied professional competencies that are available on the University faculty. Additional information about the Bureau's services may be obtained from the Director, Bureau of Educational Research and Field Services.

CURRICULUM LABORATORY

The curriculum laboratory provides students, faculty and teachers in the field with materials and assistance in the area of curriculum. An up-to-date collection of curriculum materials is maintained. This includes texts, courses of study, study guides, curriculum studies, and bibliographies. The laboratory is equipped to assist students and student teachers with preparation of teaching plans.

EDUCATIONAL TECHNOLOGY CENTER

The center is designed to serve as a service facility for faculty and students by providing teaching aids of all kinds, audio-visual equipment and service, instruction in all aspects of instructional materials, aids, and new media. This 12-room complex contains model, flexible-in-size classrooms for optimal use of instructional media, an independent learning laboratory with 40 student stations, production and distribution rooms for a closed-circuit television and video tape system, laboratories for graphic and photographic production, and space for faculty research and development in the use of instructional media. Supporting the professional faculty in the operation of the Center are such media specialists as a graphic artist and a television technician.

While the Educational Technology Center will function as a demonstration facility for on- and off-campus groups requiring model media facilities, it is also designed to serve an instructional program offering graduate degrees in educational technology.

UNIVERSITY NURSERY-KINDERGARTEN LABORATORY SCHOOL

Housed in the College of Education, the Nursery-Kindergarten Laboratory School services the total University in the following ways: (1) acts as a center in which individual professors or students may conduct research; (2) serves as

a unit for undergraduate and graduate students to have selected experiences with young children, such as student teaching, child study, and other forms of participation in a program for young children; (3) provides a setting in which educators from within and without the University can come for sources of ideas relative to the education of young children. Further information about the School's facilities or services can be obtained by contacting the Director.

READING CENTER

The reading center provides clinical diagnostic and corrective services to a limited number of children. These services are a part of the program in correction and remedial reading offered to teachers on the graduate level.

SCIENCE TEACHING CENTER

The Science Teaching Center has been designed to serve as a representative facility of its type to fulfill its functions of undergraduate and graduate science teacher education, science supervisor training, basic research in science education, aid to in-service teachers and supervisors, and consultative services, all K-16. Its reference library features relevant periodicals, science and mathematics textbooks, new curriculum materials, and works on science subjects and their operational aspects. Its fully equipped research laboratory, in addition to its teaching laboratories for science methods courses, provides project space for both faculty and students.

Since 1962 the Science Teaching Center has served as the headquarters for the activities of the Science Teaching Materials Review Committee of the National Science Teachers Association. The Information Clearinghouse on Science and Mathematics Curricular Developments, located here that year also, is now the International Clearinghouse for A.A.A.S., N.S.F. and UNESCO. Within the Center, then, is gathered the "soft-ware" and "hardware" of science education in what is considered to be one of the most comprehensive collections of such materials in the world.

OFF-CAMPUS COURSES

Through the University College, a number of courses in education are offered in Baltimore, in other centers in Maryland, and overseas. These courses are chosen to meet the needs of groups of students in various centers. In these centers, on a part-time basis, a student may complete a part of the work required for an undergraduate or a graduate degree. Announcements of such courses may be obtained by addressing requests to the Dean, University College, College Park, Maryland.

STUDENT AND PROFESSIONAL ORGANIZATIONS

The College of Education sponsors several professional organizations. Phi Delta Kappa, the national professional fraternity for men in education, and Iota Lambda Sigma, the national honorary fraternity in industrial education, have large and active chapters. The College of Education sponsors a chapter of the National Honorary Society, Kappa Delta Pi, which is open to men and women in the field of education. The College also sponsors a chapter of the Student National Education Association, which is open to undergraduate students on the College Park campus.

A student chapter of the Council for Exceptional Children is open to undergraduate and graduate students interested in working with exceptional children.

A student chapter of the Music Educators National Conference (MENC) is sponsored by the Department of Music, and the Industrial Education Department has a chapter of the American Society of Tool and Manufacturing Engineers and a chapter of the American Industrial Arts Association.

In several departments there are informal organizations of students.

UNIVERSITY CREDENTIAL SERVICE

The University provides placement assistance for graduating seniors, advanced degree candidates and those persons completing teacher certification requirements. All graduating seniors on the College Park campus (except Education for Industry majors) are required to file credentials with this office prior to graduation. A registration fee is charged.

Credentials are a permanent record of a student's academic preparation plus recommendations from academic and professional sources. Registrants are notified of positions for which they qualify. On-campus interviews are scheduled with educational administrators. The service is available to alumni as well. For further information contact the Assistant Director of Placement, Shoemaker Building.

Undergraduate Programs

*Requirements for Admissions*¹

FALL SEMESTER

All applications for full-time undergraduate admission for the fall semester at the College Park campus must be submitted to the University before June 1. (Note earlier date of May, for Pre-College Summer Session students). High school students are encouraged to file their applications for admission during the fall months of their senior year. Any student registered for nine or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission, must be received by the appropriate University office by July 15. This means that the applicant's educational records (except current summer school grades), SAT scores (in the case of new freshmen) and medical examination reports must be received by July 15.

SPRING SEMESTER

The deadline for the receipt of applications for the spring semester is January 2.

¹ See information on Admission to Teacher Education on page 22.

UNIVERSITY COLLEGE

The application deadlines and fees given above *do not* apply to students registering in the evening classes offered by the University College.

General Requirements

In selecting students emphasis will be placed upon high marks and other indications of probable success in college rather than upon a fixed pattern of subject matter. Of the sixteen required units, four units of English and one unit of social sciences, natural sciences, and mathematics are required. Additional units in mathematics, natural sciences, and social sciences are desirable for a program that permits the greatest amount of flexibility in meeting the requirements of various College of Education curricula. A foreign language is desirable for certain programs. Fine arts, trade and vocational subjects are acceptable as electives. Every prospective applicant should be certain that his preparation in mathematics is adequate for any program that he might wish to enter.

Students are referred to the publication *An Adventure in Learning* for a complete statement of requirements for admission to the different curricula in the College of Education.

Candidates for admission whose high school or college records are consistently low are strongly advised not to seek admission to the College of Education.

General Information

Detailed information concerning the General Education Program, fees and expenses, scholarships and awards, student life, and other material of a general nature, may be found in the University publication entitled, *An Adventure in Learning*. This publication may be obtained on request from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park. A detailed explanation of the regulations of student and academic life may be found in the University publication entitled, *General and Academic Regulations*.

Requests for course catalogs for the individual schools and colleges should be directed to the deans of these respective units, addressed to:

COLLEGES LOCATED AT COLLEGE PARK:

Dean
(College in which you are interested)
The University of Maryland
College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean
(College in which you are interested)
The University of Maryland
Lombard and Greene Streets
Baltimore, Maryland 21201

Air Force ROTC Programs

Two programs in Air Science are offered at the University of Maryland. Both of these programs are voluntary. The successful completion of either program qualifies the student for a reserve commission in the United States Air Force upon graduation. Exceptionally well qualified students may receive a Regular Officer appointment. The two programs are designed to fit the needs of eligible college male students who begin their higher education at either a junior college or a four year college. Emphasis is placed on qualities of leadership and other attributes essential to progressive advancement into positions of increasing responsibility as commissioned officers in the United States Air Force. For details of these programs the student should consult the publication *An Adventure in Learning*, or appropriate Department of Air Science publications.

Physical Education and Health

All undergraduate men and women students who are registered for more than nine semester hours of credit are required to enroll in and successfully complete two prescribed courses in physical education for a total of two semester hours of credit. The successful completion of these courses is required for graduation. These courses must be taken by all eligible students during the first two semesters of attendance at the University, whether they intend to graduate or not. Men and women who have reached their thirtieth birthday are exempt from these courses. The thirtieth birthday must precede the Saturday of registration week. Students who are physically disqualified from taking these courses must enroll in adaptive courses for which credit will be given. A transferring student who can meet the academic requirements of his college and the requirements of the University by completing 30 academic hours will not be required to register for physical education. Students with military service may receive credit for these courses by applying to the Director of the Men's Physical Education Program. Students majoring or minoring in physical education, recreation, or health education may meet these requirements by enrolling in special professional courses.

All freshmen students are required to complete satisfactorily one semester of Health Education (Hea. 5) for graduation. Students who have reached their thirtieth birthday are exempt from this requirement. Transfer students who do not have credit in this course, or its equivalent, must complete this requirement.

All students not required to complete the required physical education and/or health courses must elect a comparable number of hours in academic courses in addition to the regular requirements of their program.

Guidance in Registration

At the time of matriculation each student is tentatively assigned to a member of the faculty who acts as the student's adviser. The choice of subject areas within which the student will prepare to teach will be made under faculty guidance during the freshman year. The student will confer regularly with the faculty member in the College of Education responsible for his teaching major. While it may be possible to make satisfactory adjustments as late as the junior year for students from other colleges who have not already entered upon the

sequence of professional courses, it is highly desirable that the student begin his curriculum work in the freshman year. *Students who intend to teach* (except Agriculture and Physical Education) *should register in the College of Education*, in order that they may have the continuous counsel and guidance of the faculty directly responsible for teacher education at the University of Maryland.

Minimum Requirements for Academic Retention

All students enrolled since the Spring semester, 1965, must satisfy the provisions of the University's academic retention plan which are detailed in the *General and Academic Regulations*. All students should become familiar with these provisions.

Students are permitted to register for upper division courses (100 or above) only after they have earned a minimum of 56 hours of credit.

ADMISSION TO TEACHER EDUCATION

All students, full or part-time, who are in a teacher education curriculum, must apply to the Admission to Teacher Education Committee for admission to teacher education at the beginning of the semester immediately after earning 42 hours, excluding required physical education. Transfer students with 42 or more hours of acceptable transfer credit must apply at time of transfer. Post-graduate certification students must apply at the beginning of their program. Application forms may be obtained from the College of Education office, advisers, or departmental offices.

In considering applications, the following criteria have been established by the committee:

1. For full approval, applicants shall have a cumulative g.p.a. of at least 2.20. Those who do not have a 2.20 g.p.a. by the end of the semester in which they apply will not be allowed to enter in the program.
2. For full approval, a new transfer student with 42 or more hours of acceptable transfer credit will be required to earn a g.p.a. of 2.20 in University credits in his first semester at the University of Maryland, or, if part-time, by the time he has completed 12 hours at the University.
3. No student will be allowed to enroll in EDUC. 110 and methods classes until he has received full approval, except those transfer students who transfer in with 56 hours of acceptable credit and with a 2.20 g.p.a. for all work attempted at previous institutions. For full approval, transfer students who fit this category must earn a 2.20 g.p.a. during their first semester or, if part-time, by the time 12 hours have been completed.
4. Full approval is always granted with the understanding that the student must have a successful field experience in EDUC. 110, and that any case may be reconsidered by the committee if subsequent academic performance falls consistently below the 2.30 which is required for student teaching.
5. Secondary education applicants must show evidence of ability to achieve on an above average level in courses directly related to their major field.
6. Applicants must be of good moral and ethical character. This will be determined as fairly as possible from such evidences as advisers' recommendations and records of serious campus delinquencies.

7. Applicants must be physically and emotionally capable of functioning as teachers. This will mean freedom from serious chronic illness, emotional instability, and communicable disease, as determined in cooperation with the Health Service and the Counseling Center.
8. Applicants must be free of serious speech handicaps.

The purpose of the screening procedure associated with admission to teacher education is to insure that graduates of the teacher education program will be well prepared for teaching and can be recommended for certification with confidence.

Certification of Teachers

The State Department of Education certifies to teach in the approved public schools of the state only graduates of approved colleges who have satisfactorily fulfilled subject-matter and professional requirements. The curricula of the College of Education fulfill State Department requirements for certification.

Degrees

The degrees conferred upon students who have met the conditions prescribed for a degree in the College of Education are Bachelor of Arts and Bachelor of Science. Majors in art, English, languages, social sciences, and speech receive the B.A. degree. Mathematics and elementary art majors may receive either degree. All others receive the B.S. degree.

Costs

Actual annual costs of attending the University for an undergraduate student include \$300.00 fixed charges; \$104.00 special fees; \$480.00 board; \$340.00 lodging for Maryland residents, or \$440.00 for residents of other states and countries. A matriculation fee of \$10.00 is charged all new students. A fee of \$10.00 must accompany a prospective student's application for admission. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. A charge of \$450.00 for tuition is assessed to all students who are non-residents of the state of Maryland.

An Adventure in Learning, the undergraduate catalog of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park.

Remission of Fees

A full time undergraduate student in the College of Education who signs and honors a pledge to teach for two years full-time in the public schools of Maryland immediately following graduation and who remains in good standing academically may receive remission of fixed charges for a maximum of four academic years while enrolled at the University of Maryland. *This opportunity is available to residents of Maryland only.* For further details write to the College of Education.

Definition of Residence and Non-Residence

Students who are minors are considered to be resident students if at the time of their registration their parents have been domiciled in the State of Maryland for at least six months.

The status of the residence of a student is determined at the time of his first registration in the University and may not thereafter be changed by him unless, in the case of a minor, his parents move to and become legal residents of Maryland by maintaining such residence for at least six months. However, the right of the minor student to change from a non-resident status to resident status must be established by him prior to the registration period set for any semester.

Adult students are considered to be residents if at the time of their registration they have been domiciled in Maryland for at least six months provided such residence has not been acquired while attending any school or college in Maryland or elsewhere. Time spent on active duty in the armed services while stationed in Maryland will not be considered as satisfying the six-months period referred to above except in those cases in which the adult was domiciled in Maryland for at least six months prior to his entrance into the armed service and was not enrolled in any school during that period.

The word "domicile" as used in this regulation shall mean the permanent place of abode. For the purpose of this rule only one domicile may be maintained.

Graduate Studies

For graduate study in education, requirements for admission vary with degree or diploma and special area for which the applicant is applying. Both the Department of Education and the Graduate School must be satisfied as to the ability of the student to do graduate work.

Graduate students in education are required to take a test battery either after admission to the Graduate School, or before, if results are needed as admission information.

Application for Admission

A graduate student in education must matriculate in the Graduate School. Application for admission to the Graduate School must be made by July 15 for the fall term; December 15 for the spring term; and May 15 for the summer school.

Master's Degrees

A graduate student in education may matriculate for a Master of Education or a Master of Arts degree. For requirements of these degrees, the student should consult both the Graduate School Announcements and material issued by the College of Education.

Advanced Graduate Specialist in Education

A student who wishes to enter this program must have completed a master's degree or its equivalent and be otherwise acceptable. The student is admitted to the Graduate School on a special non-degree basis. For requirements of this program, the student should consult the bulletin issued by the College of Education.

Doctoral Degrees

Programs leading to a Doctor of Philosophy in education or a Doctor of Education degree are administered for the Graduate School by the Department of Education. For requirements of these degrees, the student should consult both the Graduate School Announcements and the statement of policy relative to doctoral programs in education.

Curricula and Required Courses

THE UNDERGRADUATE CURRICULA IN THE COLLEGE OF EDUCATION WITH ADVISERS for each curriculum are as follows:

AGRICULTURAL AND EXTENSION EDUCATION (under College of Agriculture)

V. R. Cardozier, Alfred Krebs

EARLY CHILDHOOD-ELEMENTARY EDUCATION

EARLY CHILDHOOD EDUCATION

James L. Hymes, Jr.
Sarah Lou Leeper

Joan E. Moyer
Margaret A. Stant

ELEMENTARY EDUCATION

Kathleen G. Amershek
Robert B. Ashlock
Glenn O. Blough
Bruce W. Brigham
Janet Carsetti
Robert V. Duffey
George Eley
MaryAnne Hall
Wayne L. Herman
C. Keith Martin
Susannah M. McCuaig

Richard W. O'Donnell
Leo W. O'Neill
James E. Potterfield
Jesse A. Roderick
Alvin W. Schindler
Elisabeth Schumacher
Dorothy D. Sullivan
V. Phillips Weaver
David L. Williams
Robert M. Wilson
Lillian B. Zachary

INDUSTRIAL EDUCATION

Charles Beatty
Clifton Campbell
Kinneth Chambliss
Edmund D. Crosby

Joseph F. Leutkemeyer
Donald Maley
Walter Mietus
William F. Tierney

LIBRARY SCIENCE EDUCATION

Evelyn J. Anderson
Dale W. Brown

James W. Liesener

SECONDARY EDUCATION

ART EDUCATION

William R. Bradley
John Lembach

Edward L. Longley, Jr.

BUSINESS EDUCATION

C. R. Anderson
Martha Mead

Robert Peters
Jane O'Neill

ENGLISH EDUCATION

Bruce Brigham
Marie D. Bryan
John Carr

Edward James
Leonard Woolf

FOREIGN LANGUAGE EDUCATION

Vincent Kelly

HOME ECONOMICS EDUCATION

Margaret Briggs

Louise Lemmon

MATHEMATICS EDUCATION

Mildred Cole
Helen Garstens

James Henkelman
Henry Walbesser

MUSIC EDUCATION

Beula B. Blum
Stavroula Fanos

Rose Marie Grentzer
Shirley J. Shelley

PHYSICAL EDUCATION (Men)

Albert W. Woods

PHYSICAL EDUCATION (Women)

Alice M. Love

SCIENCE EDUCATION

Phillip DiLavore
Marjorie Gardner

Charles LaRue
J. David Lockard

SOCIAL STUDIES EDUCATION

Arthur Adkins
Elwood Campbell
Richard Farrell
Barbara Finkelstein

Jean Grambs
Eugene Kinerney
Rao Lindsay

SPEECH EDUCATION

Andrew Wolvin

SPECIAL EDUCATION

Dorothy D. Campbell
Jean R. Hebler
Franz Huber

Eric Seidman
Betty H. Simms
Douglas Wiseman

Majors and Minors

In the Early Childhood-Elementary Curriculum no major or minor is required but students must complete at least 80 hours of academic work which includes an area of concentration of at least 18 hours.

In secondary education, majors only are required except in Speech Education, although minors may be developed in most programs if students desire them. Specific programs should be consulted for information concerning minors.

General Requirements of the College

Minimum requirements for graduation are 120 academic semester hours plus the four semester hours in required physical education and health. Specific program requirements for more than the minimum must be fulfilled. In no case may a student graduate with less than a total of 124 hours.

Minimum requirements for graduation, exclusive of the specific requirements for each curriculum, include the 38 hours in the University General Education Program. These are: English—9 hours; Fine Arts or Philosophy—3 hours; History—6 hours; Mathematics—3 hours; Science—7 hours; Social Science—6 hours; Physical Education—2 hours; and Health—2 hours. (Details of the General Education Program are available in the University publication *An Adventure in Learning*.) In addition to these requirements, the college requires a minimum of 20 hours of education courses and 3 hours of speech.

Marks in all required upper division courses in education and in subjects in major and minor fields must be "C" or higher. A general average of "C" or higher must be maintained.

Exceptions to curricular requirements and rules of the College of Education must be recommended by the student's adviser and approved by the Dean.

Students who are not enrolled in the College of Education but who are preparing to teach and wish to register in professional education courses required for certification must meet all curricular and scholastic requirements of the College of Education.

Student Teaching

In order to be admitted to a course in student teaching, a student must have a grade point average of 2.30, based on University of Maryland courses only, a physician's certificate indicating that the applicant is free of communicable diseases, and the consent of the instructor in the appropriate area. Application must be made with the Coordinator of Laboratory Experiences at the beginning of the semester which precedes the one in which student teaching will be done. Any applicant for student teaching must have been enrolled previously at the University of Maryland for at least one semester.

AGRICULTURAL AND EXTENSION EDUCATION

This curriculum is designed to prepare students for teaching vocational agriculture in high schools. To obtain full particulars on course requirements, the student should consult the catalog of the College of Agriculture.

EARLY CHILDHOOD-ELEMENTARY EDUCATION

The Department of Early Childhood-Elementary Education offers two undergraduate curriculums leading to the Bachelor of Science degree:

1. Early Childhood Education—for the preparation of teachers in nursery school, kindergarten, and primary grades (grades one, two, and three).
2. Elementary Education—for the preparation of teachers of grades one through six.

Students who wish to become certificated teachers for nursery school and/or kindergarten must follow the Early Childhood Education curriculum (1. above). Students who seek certification for teaching the intermediate grades must follow the Elementary Education curriculum (2. above). Students who plan to teach in the primary grades can achieve certification in either 1. or 2.

Area of Academic Concentration

Students in Early Childhood-Elementary Education are required to develop within their degree programs an Area of Academic Concentration consisting of a minimum of eighteen semester hours, at least twelve semester hours beyond required work in the Area. Approved areas are: Anthropology, Astronomy, Botany, Chemistry, Economics, English, Fine Arts (Arts, Dance, Drama, and Music), Foreign Language, Geography, Geology, History, Mathematics, Natural Sciences (Astronomy, Botany, Chemistry, Geology, Meteorology, Physics, Zoology), Philosophy, Physics, Psychology, Social Science (Economics, Government and Politics, Psychology, Sociology), Sociology, Zoology.

Graduation Requirements

One hundred twenty (120) academic credits *plus* the required Health and Physical Education are required for graduation. At least eighty (80) of the academic credits must be in fields other than Education.

EARLY CHILDHOOD EDUCATION

(Nursery-Kindergarten-Primary)

The early childhood education curriculum has as its primary goal the preparation of nursery school, kindergarten, and primary teachers.

Observation and student teaching are done in the University Nursery-Kindergarten School on the campus and in approved schools in nearby communities.

Graduates receive a B.S. degree and meet the requirements for certification for teaching kindergarten and nursery school and primary grades in Maryland. Each student should have extensive experience in working with children prior to the junior year.

FRESHMAN YEAR	Semester	
	I	II
ENGL 001—Composition <i>or</i> ENGL 021— Honors Composition	3	..
ENGL 003—World Literature .....	..	3
SPCH 003—Fundamentals of General American Speech <i>or</i> SPCH 001—Public Speaking <i>or</i> SPCH 004—Voice and Diction	3	..
HLTH 005—Science and Theory of Health	2	..
PHYSICAL EDUCATION	1	1
MUSC 016—Fundamentals	3	..

	Semester	
	I	II
FRESHMAN YEAR (Continued)		
ART 040—Fundamentals of Art Education <i>or</i> APPLIED DESIGN 001—Fundamentals of Design		3
BOTN 001—General Botany <i>or</i> ENTM 005 Insects <i>or</i> MICB 001—General Microbiology <i>or</i> ZOO 001—General Zoology	3	or 4 ² ..
ASTR 001—Introduction to Astronomy <i>or</i> CHEM 001—General Chemistry <i>or</i> GEOL 001—Geology <i>or</i> PHYS 001—Elements of Physics: Mechanics, Heat and Sound		3 or 4 ²
HIST 021—History of the U.S. to 1865 <i>or</i> HIST 022—History of the U.S. since 1865 <i>or</i> HIST 023—Social and Cultural History of Early America <i>or</i> HIST 024—Social and Cultural History of Modern America <i>or</i> HIST 029—The U.S. in World Affairs		3 3
APPROVED ELECTIVE		3
	15 or 16	16 or 17
SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
MATH 030—Elements of Mathematics	4	..
MATH 031—Elements of Geometry		4
GEOG 010—General Geography <i>or</i> GEOGRAPHY 011— General Geography		3 ³
ANTHROPOLOGY 001—Introduction to Anthropology <i>or</i> ECON 031—Principles of Economics <i>or</i> ECON 037— Fundamentals of Economics <i>or</i> GVPT 001—American Government <i>or</i> GVPT 003—Principles of Government and Politics <i>or</i> PSYC 001—Introduction to Psychology <i>or</i> SOCY 001—Introduction to Sociology	3	3
BOTN 001 <i>or</i> ENTM 005 <i>or</i> MICB 001 <i>or</i> ZOO 001 <i>or</i> ASTR 001 <i>or</i> CHEM 001 <i>or</i> GEOL 001 <i>or</i> PHYS 001	3 or 4	
HIST 031—Latin American History <i>or</i> HIST 032—Latin American History <i>or</i> HIST 041—Western Civilization <i>or</i> HIST 042—Western Civilization <i>or</i> HIST 051—The Humanities <i>or</i> HIST 052—The Humanities <i>or</i> HIST 053—History of England and Great Britain <i>or</i> HIST 054—History of England and Great Britain <i>or</i> HIST 061—Far Eastern Civilization <i>or</i> HIST 062—Far Eastern Civilization <i>or</i> HIST 071—Islamic Civilization <i>or</i> HIST 072—Islamic Civilization		3 3
APPROVED ELECTIVE	3	3
	16 or 17	16

² One science course among the three required must be a laboratory course.³ Students who take GEOL 001 should take GEOG 011.

JUNIOR YEAR

(Semester)
I II

ART 010—Introduction to Art <i>or</i> ART 060—History of Art <i>or</i> ART 061—History of Art <i>or</i> ART 065—Masterpieces of Painting <i>or</i> ART 066—Masterpieces of Painting <i>or</i> ART 067—Masterpieces of Sculpture <i>or</i> ART 068—Masterpieces of Sculpture <i>or</i> ART 070—Masterpieces of Architecture <i>or</i> ART 071—Masterpieces of Architecture <i>or</i> ART 080—History of American Art <i>or</i> ART 081—History of American Art <i>or</i> DANC 032—Introduction to Dance <i>or</i> DANC 182—History of Dance <i>or</i> DANC 184—Theory and Philosophy of Dance <i>or</i> MUSC 020—Survey of Music Literature <i>or</i> SPCH 016—Introduction to the Theatre <i>or</i> SPCH 114—Film as an Art Form <i>or</i> PHIL 001—Introduction to Philosophy <i>or</i> PHIL 041—Elementary Logic and Semantics <i>or</i> PHIL 045—Ethics <i>or</i> PHIL 052—Philosophy in Literature <i>or</i> PHIL 053—Philosophy of Religion <i>or</i> PHIL 056—Philosophy of Science <i>or</i> PHIL 147—Philosophy of Art <i>or</i> PHIL 152—Philosophy of History <i>or</i> PHIL 154—Political and Social Philosophy	3	..
EDUC 110—Human Development and Learning	6	<i>or</i> 6
EDEL 115—Activities and Materials in Early Childhood Education	3	..
EDEL 116—Music in Early Childhood Education	3	..
EDEL 105A—Science in the Elementary School .....	..	2
EDEL 122A—Social Studies in the Elementary School .....	..	2
EDEL 123A—The Child and the Curriculum .....	..	2
EDEL 126A—Mathematics in the Elementary School .....	..	2
EDEL 153A—The Teaching of Reading .....	..	2
APPROVED ELECTIVES	6	<i>or</i> 6
	15	16

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
EDEL 149—Student Teaching in the Elementary School: A.—Nursery School, 4 s.h.; B.—Kindergarten, 4 s.h.; C.—Primary Grades, 8 s.h.	8	8
APPROVED ELECTIVES	4	7
	15	15

ELEMENTARY EDUCATION

This curriculum is designed for regular undergraduate students who wish to qualify for teaching positions in elementary schools. Students who complete the curriculum will receive the Bachelor of Science degree, and they will meet the Maryland State Department of Education requirements for the Standard Professional Certificate in Elementary Education. The curriculum also meets certification requirements in many other states, Baltimore, and the District of Columbia.

FRESHMAN YEAR	Semester	
	I	II
ENGL 001—Composition <i>or</i> ENGL 021—Honors Composition	3	..
ENGL 003—World Literature .....	..	3
SPCH 003—Fundamentals of General American Speech <i>or</i> SPCH 001—Public Speaking <i>or</i> SPCH 004—Voice and Diction	3	..
HLTH 005—Science and Theory of Health	2	..
PHYSICAL EDUCATION	1	1
MUSC 016—Fundamentals	3	..
ART 040—Fundamentals of Art Education <i>or</i> APPLIED DESIGN 001—Fundamentals of Design .....	..	3
BOTN 001—General Botany <i>or</i> ENTM 005—Insects <i>or</i> MICB 001—General Microbiology <i>or</i> ZOOL 001— General Zoology	3 or 4 ⁴	
ASTR 001—Introduction to Astronomy <i>or</i> CHEM 001—General Chemistry <i>or</i> GEOL 001—Geol- ogy <i>or</i> PHYS 001—Elements of Physics; Mechanics, Heat and Sound		3 or 4 ⁴
HIST 021—History of the U.S. to 1865 <i>or</i> HIST 022—History of the U.S. since 1865 <i>or</i> HIST 023—Social and Cultural History of Early America <i>or</i> HIST 024—Social and Cultural History of Modern America <i>or</i> HIST 029—The U. S. in World Affairs .....	..	3
APPROVED ELECTIVE .....	..	3
	15 or 16	16 or 17

SOPHOMORE YEAR

ENGL 004—World Literature	3	..
MATH 030—Elements of Mathematics	4	..
MATH 031—Elements of Geometry .....	..	4
GEOG 010—General Geography <i>or</i> GEOG 011—General Geography .....	..	3 ⁵
ANTH 001—Introduction to Anthropology <i>or</i> ECON 031— Principles of Economics <i>or</i> ECON 037—Fundamentals of Economics <i>or</i> GVPT 001—American Government <i>or</i> GVPT 003—Principles of Government and Politics <i>or</i> PSYC 001—Introduction to Psychology <i>or</i> SOCY 001— Introduction to Sociology	3	3
BOTN 001 <i>or</i> ENTM 005 <i>or</i> MICB 001 <i>or</i> ZOOL 001 <i>or</i> ASTR 001 <i>or</i> CHEM 001 <i>or</i> GEOL 001 <i>or</i> PHYS 001	3 or 4	
HIST 031—Latin American History <i>or</i> HIST 032—Latin American History <i>or</i> HIST 041—Western Civilization <i>or</i> HIST 042—Western Civilization <i>or</i> HIST 051—The Humanities <i>or</i> HIST 052—The Humanities <i>or</i> HIST 053—History of England and Great Britain <i>or</i> HIST 054—History of England and Great Britain <i>or</i> HIST		

⁴ One science course among the three required must be a laboratory course.⁵ Students who take GEOL 001 should take GEOG 002.

SOPHOMORE YEAR (Continued)

(Semester—
I II)

061—Far Eastern Civilization <i>or</i> HIST 062—Far Eastern Civilization <i>or</i> HIST 071—Islamic Civilization <i>or</i> HIST 072—Islamic Civilization .....	..	3
APPROVED ELECTIVES	3	3
	16 or 17	16

JUNIOR YEAR

ART 010—Introduction to Art <i>or</i> ART 060—History of Art <i>or</i> ART 061—History of Art <i>or</i> ART 065—Masterpieces of Painting <i>or</i> ART 066—Masterpieces of Painting <i>or</i> ART 067—Masterpieces of Sculpture <i>or</i> ART 068—Masterpieces of Sculpture <i>or</i> ART 070—Masterpieces of Architecture <i>or</i> ART 071—Masterpieces of Architecture <i>or</i> ART 080—History of American Art <i>or</i> ART 081—History of American Art <i>or</i> DANC 032—Introduction to Dance <i>or</i> DANC 182—History of Dance <i>or</i> DANC 184—Theory and Philosophy of Dance <i>or</i> MUSC 020—Survey of Music Literature <i>or</i> SPCH 016—Introduction to the Theatre <i>or</i> SPCH 114—The Film as an Art Form <i>or</i> PHIL 001—Introduction to Philosophy <i>or</i> PHIL 041—Elementary Logic and Semantics <i>or</i> PHIL 045—Ethics <i>or</i> PHIL 052—Philosophy of Literature <i>or</i> PHIL 053—Philosophy of Religion <i>or</i> PHIL 056—Philosophy of Science <i>or</i> PHIL 147—Philosophy of Art <i>or</i> PHIL 152—Philosophy of History <i>or</i> PHIL 154—Political and Social Philosophy	3	..
EDUC 110—Human Development and Learning	6	<i>or</i> 6
EDEL 052—Introduction to Children's Literature	2 ⁶	..
EDEL 105B—Science in the Elementary School	2 ⁶	..
EDEL 121B—Language Arts in the Elementary School .....	..	2 ⁶
EDEL 122B—Social Studies in the Elementary School	2 ⁶	..
EDEL 126B—Mathematics in the Elementary School .....	..	2 ⁶
EDEL 153B—The Teaching of Reading .....	..	2 ⁶
APPROVED ELECTIVES	0 or 6	3 or 9
	15	15

SENIOR YEAR

EDEL 149D—Student Teaching in the Elementary School ..	16	..
EDUC 111—Foundations of Education .....	..	3
EDEL 125—Art in the Elementary School <i>or</i> EDMU 128—Music for the Elementary Classroom Teacher <i>or</i> PHED 120—Physical Education for Elementary Schools		2 or 3
APPROVED ELECTIVES	0	9
	16	14 or 15

⁶ All the courses may *not* be taken in one semester.

AREA OF SPECIALIZATION IN ELEMENTARY SCHOOL PHYSICAL EDUCATION AND HEALTH EDUCATION

Students enrolled in the College of Education and majoring in elementary education may pursue an area of specialization in elementary school physical education and health education. Students interested in this area should consult the Dean of the College of Physical Education, Recreation and Health.

AREA OF SPECIALIZATION IN ELEMENTARY SCHOOL MUSIC EDUCATION

Students enrolled in the College of Education and majoring in elementary education may pursue an area of specialization in elementary school music education with vocal or instrumental emphasis, and thereby qualify for the Bachelor of Science certificate in special subjects. In order to fulfill requirements in this area, the following courses should be taken in addition to those required in the Elementary Education curriculum: 13 semester hours in music theory, history, and conducting; 14 semester hours in applied music, divided between major and minor *performance areas*; 2 semester hours in methods; and 6 semester hours of student teaching.

The specific courses in performance areas are as follows:

MUSC 001 (3); MUSC 007, 008 (3, 3, 4); MUSC 121, 160 (3, 2). Applied Music (14), divided between the student's major and minor *performance areas*. EDMU 139 (2) for vocal emphasis or EDMU 129 (2) for instrumental emphasis, in place of EDMU 128 (2).

Student teaching, 6 semester hours.

Geography Requirements:

Add GEOG 011, General Geography (cultural), as an option for lower division requirement.

Select any one three-credit course from the 100-level regional Geography offerings.

Mathematics and the Sciences: (18-20 hours)

MATH 030 (4)

MATH 031 (4)

Three courses in science; one must be a laboratory course:

- | | | |
|---|---|---------|
| A. One in physical science: Astro., Chem., Geol., or Physics | } | (10-12) |
| B. One in biological science: Bot., Entm., Micro., or Zool. | | |
| C. One additional course either in physical or biological science | | |

Area of Academic Concentration: (12-18 hours)

Area of academic concentration is 18 hours of which at least 12 hours must be beyond college requirements.

Electives in General Education: (14-16 hours)

Total Hours: 80-80 hours.

ART EDUCATION CURRICULUM—ELEMENTARY (See page 44)

FOREIGN LANGUAGE IN THE ELEMENTARY SCHOOL (FLES) CURRICULUM

Elementary Education majors wishing to teach Foreign Language in elementary schools may be allowed to apply for certification if they have a minimum of 24 semester hours in the foreign language plus EDEL 143, Foreign Language

Methods in the Elementary School. Arts and Science foreign language majors, and Secondary Education foreign language majors are also eligible for admission. Students interested in FLES should contact the Foreign Language Education adviser in the Department of Secondary Education for further information concerning the requirements for certification in FLES.

INDUSTRIAL EDUCATION

Three curriculums are administered by the Industrial Education Department: (1) Industrial Arts Education, (2) Vocational-Industrial Education, and (3) Education for Industry. The overall offering includes both undergraduate and graduate programs leading to the degrees of: Bachelor of Science, Master of Education, Master of Arts, Doctor of Education, and Doctor of Philosophy.

The industrial arts education curriculum prepares persons to teach industrial arts at the secondary school level. It is a four-year program leading to a Bachelor of Science degree. While trade or industrial experience contributes significantly to the background of the industrial arts teacher, previous work experience is not a condition of entrance into this curriculum. Students who are enrolled in the curriculum are encouraged to obtain work in industry during the summer months. Industrial arts as a secondary school subject area is a part of the general education program characterized by extensive laboratory experiences.

The vocational-industrial curriculum may lead either to certification as a vocational-industrial teacher with no degree involved or to a Bachelor of Science degree, including certification. The University of Maryland is designated as the institution which shall offer the "Trade and Industrial" certification courses and hence the courses which are offered are those required for certification in Maryland. The vocational-industrial curriculum requires trade competence as specified by the *Maryland State Plan for Vocational Education*. A person who aspires to take the certification courses should review the state plan and may well contact Maryland State Department of Education officials. If the person has in mind teaching in a designated city or county he may discuss his plans with the vocational-industrial official of that city or county inasmuch as there are variations in employment and training procedures.

INDUSTRIAL ARTS EDUCATION

FRESHMAN YEAR

	Semester	
	I	II
ENGL 001—Composition	3	..
ENGL 003—World Literature <i>or</i> .....	..	3
ENGL 004—World Literature .....	..	3
SOCY 001—Introduction to Sociology <i>or</i> PHIL 001—Intro- duction to Philosophy <i>or</i> PSYC 001—Introduction to Psychology	3	..
PHED 001, 003—Physical Activities	1	1
SPCH 001—Public Speaking	3	..
EDIN 001—Mechanical Drawing I	2	..
EDIN 002—Woodworking I	3	..
EDIN 012—Shop Calculation .....	..	3
ART—Art Elective <i>or</i> .....	..	..
PHIL—Philosophy Elective .....	..	3
HLTH 005—Science and Theory of Health .....	..	2
EDIN 021—Mechanical Drawing II .....	..	2
EDIN 022—Woodworking II .....	..	3
Total	15	17

	Semester	
	I	II
SOPHOMORE YEAR		
ENGL 004—World Literature <i>or</i> .....	..	..
ENGL 003—World Literature	3	..
HIST 021—History of U. S. to 1865, <i>or</i> .....	..	..
HIST 022—History of U. S. since 1865	3	..
HIST—History Elective .....	..	3
PHYS 001 and PHYS 002—Elements of Physics: Mechanics, Heat and Sound	3	3
EDIN 028—Electricity—Electronics I	3	..
EDIN 033—Automotives I	3	..
EDIN 041—Architectural Drawing	2	..
MATH 010—Introduction to Mathematics .....	..	3
EDIN 048—Electricity—Electronics II .....	..	3
EDIN 023—Arc and Gas Welding .....	..	1
EDIN 110—Foundry .....	..	1
Total	17	14
JUNIOR YEAR		
CHEM 001, 003—General Chemistry	4	4
EDUC 110—Human Development and Learning	6	..
ECON 037—Fundamentals of Economics .....	..	3
EDIN 069—Machine Shop Practice I	3	..
EDIN 026—General Metal Work .....	..	3
EDIN 111—Laboratory Practicum in Industrial Arts .....	..	3
EDIN 034—Graphic Arts I .....	..	3
ELEC—Elective (Laboratory)	4	..
ELEC—Elective (Unspecified) .....	..	3
Total	17	19
SENIOR YEAR		
EDIN 140—Curriculum, Instruction and Observation	3	..
EDIN 148—Student Teaching in Secondary Schools	8	..
EDIN 145—Principles and Methods of Secondary Education	3	..
EDIN 164—Laboratory Organization and Management .....	..	3
EDIN 166—Educational Foundation of Industrial Arts .....	..	2
EDUC 111—Foundations of Education .....	..	3
EDUC—Electives .....	..	6
<i>or</i> Elec.—Electives (Unspecified) .....	..	3
Total	14	17

VOCATIONAL-INDUSTRIAL EDUCATION

The vocational-industrial curriculum is a four-year program of studies leading to a Bachelor of Science degree in education. It is intended to develop the necessary competencies for the effective performance of the tasks of a vocational teacher. In addition to establishing the adequacy of the student's skills in a particular trade and the development of instructional efficiency, the curriculum aims at the professional and cultural development of the individual. Courses are included which would enrich the person's scientific, economic, psychological and sociological understandings. The vocational-certification courses for the state of Maryland are a part of the curriculum requirements.

Persons pursuing this curriculum must present documentary evidence of having an apprenticeship or comparable learning period and journeyman experi-

ence. This evidence of background and training is necessary in order that the trade examination phase of the curriculum may be accomplished.

Persons having completed the necessary certification courses prior to working on the degree program may use such courses toward meeting graduation requirements. However, after certification course requirements have been met, persons continuing studies toward a degree must take courses in line with the curriculum plan and University regulations. For example, junior level courses cannot be taken until the student has reached full junior standing.

	(Semester—)	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
ENGL 003—World Literature <i>or</i>		
ENGL 004—World Literature .....	..	3
SOCY 001—Introduction to Sociology	3	..
SPCH 001—Public Speaking	3	..
ECON 037—Fundamentals of Economics .....	..	3
EDIN 012—Shop Calculation	3	..
MATH 010—Introduction to Mathematics <i>or</i>		
MATH 003—Fundamentals of Mathematics .....	..	3
PHED 001, 003—Physical Activities	1	1
HLTH 005—Science and Theory of Health .....	..	2
Total	13	12
SOPHOMORE YEAR		
ENGL 003—World Literature <i>or</i>		
ENGL 004—World Literature	3	..
ART—Art Elective <i>or</i>		
PHIL—Philosophy Elective .....	..	3
HIST 021—History of the U. S. to 1865, <i>or</i>		
HIST 022—History of the U. S. since 1865	3	..
HIST—History Elective .....	..	3
Physical Sciences	3	3
PSYC 001—Introduction to Psychology	3	..
CHEM 001—General Chemistry <i>or</i> ZOOL 001—General		
Zoology <i>or</i> GEOG 030—Principles of Morphology .....	..	4
Total	12	13
Trade Examination		20
JUNIOR YEAR		
EDIN 150—Training Aids Development .....	..	3
EDIN 165—Modern Industry	3	..
EDUC 110—Human Development and Learning	6	..
EDIN 169—Occupational Analysis and Course Construction	3	..
CHEM III <i>or</i> Botany I <i>or</i> GEOL 040	4	..
EDIN 171—History and Principles of Vocational Education	..	3
EDIN 157—Tests and Measurements .....	..	3
Approved Electives .....	..	3
Total	16	12

SENIOR YEAR	Semester	
	I	II
EDIN 140—Curriculum, Instruction and Observation	3	..
EDIN 145—Principles and Methods of Sec. Ed.	3	..
EDIN 148—Student Teaching in Secondary Schools	8	..
EDCP 161—Introduction to Counseling and Personnel Services	3	..
Electives .....	..	6
EDUC 111—Social Foundations of Education .....	..	3
EDIN 164—Laboratory Organization and Management ....	..	3
Ed. Electives .....	..	2
Total	17	14

STUDENT TEACHING REQUIREMENT

Persons currently teaching in the secondary schools with three or more years of satisfactory experience at that level are not required to take EDIN 148—Student Teaching in Secondary Schools. Evidence of satisfactory teaching experience shall be presented in the form of written statements from the principal, area supervisor, and department head in the school where such teaching is done. Instead of the eight credits required for student teaching, the individual meeting the above qualifications will have eight additional semester hours of elective credits.

ELECTIVE CREDITS

Courses in history and philosophy of education, sociology, speech, psychology, economics, business administration, and other areas may be taken with the permission of the student's adviser.

Elective courses in the technical area (shop and drawing) will be limited to courses and subjects not covered in the trade training experience. Courses dealing with advanced technology and recent improvements in field practices will be acceptable.

VOCATIONAL-INDUSTRIAL CERTIFICATION

A person to become certified as a Trade, Industrial and Service Occupations teacher in the State of Maryland must successfully complete 18 credit hours of instruction.

The following courses must be included in the 18 credit hours of instruction:

EDIN 050—Methods of Teaching

EDIN 164—Laboratory Organization and Management

EDIN 157—Tests and Measurements

EDIN 169—Occupational Analysis and Course Construction

The remainder of the credit hours shall be met through the election of the following courses:

EDIN 150—Training Aids Development

EDIN 161—Principles of Vocational Guidance

EDIN 165—Modern Industry
 EDIN 167—Problems in Occupational Education
 EDIN 171—History and Principles of Vocational Education
 EDCP 161—Introduction to Counseling and Personnel Services
 EDCP 172—Mental Hygiene in the Classroom
 PSYC 110—Educational Psychology or its equivalent

A person in vocational-industrial education may use his certification courses toward a Bachelor of Science degree. In doing so the general requirements of the University and College of Education must be met. A maximum of twenty semester hours of credit may be earned through examination in the trade in which the student has competence. Prior to taking the examination, the student shall provide documentary evidence of his apprenticeship or learning period and journeyman experience. For further information about credit by examination refer to the publication *University General and Academic Regulations*.

EDUCATION FOR INDUSTRY

The Education for Industry curriculum is a four-year program leading to a Bachelor of Science degree. The purpose of the program is to prepare persons for jobs within industry and, as such it embraces four major areas of competence, (a) technical competence, (b) human relations and leadership competence, (c) communications competence, and (d) social and civic competence. The student who is enrolled in this curriculum is required to obtain work in industry in accordance with the plan described in the course, EDIN 084, 124.

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
ENGL 003—World Literature <i>or</i>		
ENGL 004—World Literature .....	..	3
SOCY 001 or ANTH 001—Introduction to Sociology <i>or</i>		
Introduction to Anthropology	3	..
EDIN 001—Mechanical Drawing I	2	..
EDIN 012—Shop Calculation	3	..
EDIN 021—Mechanical Drawing II .....	..	2
EDIN 022—Woodworking II	3	..
EDIN 023—Arc and Gas Welding .....	..	1
EDIN 069—Machine Shop Practice I .....	..	3
EDIN 110—Foundry .....	..	1
PHED 001, 003—Physical Activities	1	1
MATH 010—Introduction to Mathematics .....	..	3
Total	15	14

SOPHOMORE YEAR

ART—Art Elective .....	..	3
ENGL 003—World Literature <i>or</i>		
ENGL 004—World Literature	3	..
EDIN 024—Sheet Metal Work	2	..
BSAD 010—Elements of Business Enterprise	3	..
SPCH 007—Public Speaking .....	..	2

	Semester	
	I	II
SOPHOMORE YEAR (Continued)		
PHYS 001, 002—Elements of Physics: Mechanics, Heat and Sound <i>or</i> Elements of Physics: Magnetism, Electricity, and Optics <i>or</i> PHYS 010, 011—Fundamentals of Physics	3 or 4	3 or 4
MATH 011—Introduction to Mathematics	3	..
HLTH 005—Science and Theory of Health	..	2
HIST 042—Western Civilization	..	3
ECON 037—Fundamentals of Economics	..	3
EDIN 084—Organized and Supervised Work Experience	3	..
Total	17 or 18	16 or 17

JUNIOR YEAR

History Elective	3	..
PSYC 001—Introduction to Psychology	3	..
PSYC 005—Personality and Adjustment	..	3
CHEM 001, 003—General Chemistry	4	4
ECON 160—Labor Economics	3	..
EDIN 124—Organized and Supervised Work Experience	3	..
EDIN 143-144—Industrial Safety Education I and II	2	2
BSAD 160—Personnel Management I	..	3
SOCY 115—Industrial Sociology	..	3
Electives	3	3
Total	21	18

SENIOR YEAR

BSAD 161—Personnel Management II <i>or</i>		
BSAD 130—Business I	3	..
BSAD 163—Labor Relations	3	..
BSAD 169—Production Management	..	3
EDIN 165—Modern Industry	3	..
EDIN 125—Industrial Training in Industry <i>or</i>	3	..
EDIN 175—Recent Technological Developments in Products and Processes	..	3
PSYC 161—Industrial Psychology	..	3
Electives	5	7
Total	14	16

LIBRARY SCIENCE EDUCATION

All students anticipating work in Library Science Education should consult with advisers in this area at the beginning of the freshman year. Students enrolled in this curriculum will pursue a B.A. degree with an area of concentration of thirty-six hours in one of the following: Humanities, Social Sciences, Science, or Foreign Languages. Students may concentrate in a subject area subsumed under one of these four fields, or they may choose a broad spectrum of courses in one of the four areas under the guidance of their advisers. The minor of eighteen hours will be Library Science Education.

All students who pursue a degree in Library Science Education are required to complete two years (twelve semester hours) of the same foreign language on the College level, or the equivalent. Students who have studied French, German, or Spanish for two or more years in high school, are required to take the Foreign Language Placement Examination before they continue their study of the language concerned. Students who are placed by the examination in French, German, or Spanish 6 (the third College semester) are required to take six additional hours of that language. Students who are placed in French, German, or Spanish 7 (the fourth college semester) are required to take three additional hours of that language. Students who are placed in French or Spanish 11, or German 9 (the fifth college semester) are not required to take any further courses in that language. Students who have studied languages other than French, German, or Spanish, or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chairman of the respective language section, if feasible, or by the Head of the Department of Foreign Languages. Native speakers of a foreign language shall satisfy the foreign language requirement by taking twelve hours of English.

Students in Library Science Education will complete eight semester hours in Directed Library Experience as their student teaching requirement. It will involve a half day in school, five days per week, for sixteen weeks. This period will be divided into two sections, with eight weeks spent in an elementary school and eight weeks in a secondary school. A concurrent weekly seminar will also be a part of this experience. Students completing this curriculum will be eligible for certification as elementary or secondary school librarians.

	—Semester—	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
ENGL 003—World Literature .....	..	3
Social Science (Economics, Geography, Government and Politics, Sociology, Psychology, or Anthropology)	3	3
PHED 001, 003 (men) PHED 002, 004 (women)		
Physical Activities	1	1
Art, Music, or Philosophy	3	..
Mathematics 3—Fundamentals of Mathematics .....	..	4
Science	3	..
Science (with laboratory) .....	..	4
Foreign Language, or Elective if Advanced Placement	3	3
Total	<hr/> 16	<hr/> 18
SOPHOMORE YEAR		
SPCH 001—Public Speaking	3	..
ENGL 004—World Literature	3	..
History Requirements	3	3
Foreign Language, or Elective if Advanced Placement	3	3
HLTH 005—Science and Theory of Health .....	..	2
Area of Concentration	6	9
Total	<hr/> 18	<hr/> 17



JUNIOR YEAR	Semester	
	I	II
EDUC 110—Human Development and Learning	6	..
EDLS 120—Introduction to Librarianship	3	..
EDLS 122—Basic Reference and Information Sources	3	..
EDLS 126—Cataloging and Classification of Library Materials .....	..	3
EDLS 128—School Library Administration and Service .....	..	3
Area of Concentration	3	6
Electives	3	6
Total	18	18
SENIOR YEAR		
EDUC 111—Foundations of Education	3	..
EDLS 130—Library Materials for Children	3	..
EDLS 132—Library Materials for Youth	3	..
EDLS 148—Directed Library Experience in Elementary Schools with Seminar and EDLS 149 Directed Library Experience in Secondary Schools with Seminar. (4 each)	..	8
Area of Concentration	6	6
Electives	3	3
Total	18	17

SECONDARY EDUCATION

Students enrolled in this curriculum will meet the University general education requirements, plus the following:

All students who pursue the B.A. degree in secondary education are required to complete two years (12 semester hours) of the same foreign language on the college level, or the equivalent. Students who have studied French, German, or Spanish for two or more years in high school, or for two or three semesters in another college or university are required to take the Foreign Language Placement Examination before they continue or resume their study of the language concerned. Students who are placed in French, German, or Spanish 6 (the third college semester) are required to take six additional hours of that language. Students who are placed in French, German or Spanish 007 (the fourth college semester) are required to take three additional hours of that language. Students who are placed in French or Spanish 11, or German 9 (the fifth college semester) are not required to take any further courses in that language. Students who have studied languages other than French, German, or Spanish, or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chairman of the respective language section, if feasible, or by the Head of the Department of Foreign Languages. Native speakers of a foreign language shall satisfy the foreign language requirement by taking twelve hours of English.

All students who elect the secondary education curriculum will fulfill the preceding *general* requirements and also prepare to teach one or more school subjects which will involve meeting *specific* requirements in *particular* subject matter fields.

The Bachelor of Arts degree is offered in the teaching fields of art, English, foreign languages, mathematics, social science, and speech. The Bachelor of

Science degree is offered in business education, home economics, mathematics, music, science, and speech.

ART EDUCATION

Students in art education enroll in one of two programs, elementary or secondary art education. The proposed programs are listed below:

SECONDARY ART EDUCATION CURRICULUM

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
ENGL 003—World Literature .....	..	3
Social Science requirement	3	3
ART 010—Introduction to Art	3	..
ART 012—Design I	3	..
ART 016—Drawing I .....	..	3
HLTH 005—Science and Theory of Health .....	..	2
PHED 001, 003 (men) PHED 002, 004 (women)		
Physical Activities	1	1
Foreign Language	3	3
Total	16	15

SOPHOMORE YEAR

ENG 004—World Literature	3	..
SPCH 001—Public Speaking	3	..
Foreign Language or Electives	3	3
Mathematics .....	..	3
ART 060, 061—Art History	3	3
ART 017—Painting I .....	..	3
SPCH 014—Stagecraft	3	..
CRAF 020—Ceramics .....	..	2
Electives in Art	3	3
Total	18	14-17

JUNIOR YEAR

EDUC 110—Human Development and Learning	6	..
History Requirements	3	3
Science	3	4
APDS 030—Typography and Lettering .....	..	3
ART 026—Drawing II .....	..	3
ART 119—Printmaking I	3	..
ART 118—Sculpture I .....	..	3
Total	15	16

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
Electives	6	..
Electives in Art ⁷	7	..
EDSE 140—Curriculum, Instruction, Observation—Art .....	..	3

⁷ Art Electives must be chosen with the approval of the adviser and of the 13 credit hours required in the secondary program at least 4 must be in crafts.

SENIOR YEAR (Continued)	Semester—	
	I	II
EDUC 147—Audio-Visual Education .....	..	3
EDSE 145—Principles and Methods of Secondary Education ..	..	3
EDSE 148A—Student Teaching in the Secondary School ..	..	8
Total	16	17

ELEMENTARY ART EDUCATION CURRICULUM

FRESHMAN YEAR

ENGL 001, 003—Composition and World Literature	3	3
Social Science requirement	3	3
ART 010—Introduction to Art	3	..
ART 012—Design I or ART 040—Fundamentals of Art	3	..
ART 016—Drawing I .....	..	3
HLTH 005—Science and Theory of Health .....	..	2
PHED 001, 003 (men) PHED 002, 004 (women)		
Physical Activities	1	1
Foreign Language or electives	3	3
Total	16	15

SOPHOMORE YEAR

ENGL 004—World Literature	3	..
Science requirement	3	4
Mathematics	3	..
ART 060, 061—Art History	3	3
ART 017—Painting I .....	..	3
SPCH 001—Public Speaking	3	..
CRAF 020—Ceramics .....	..	2
Foreign Languages or electives	3	3
Total	18	15

JUNIOR YEAR

EDUC 110—Human Development and Learning	6	
History Requirements	3	3
Foreign Language or Electives	3	3
CRAF 002—Simple Crafts	2	..
ART 118—Sculpture I .....	..	3
SPCH 014—Stagecraft	3	..
Electives in Art [*]	6
Total	17	15

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
EDEL 125A—Art in the Elementary School	2	..
Electives in Art [*]	7	..
Electives	3	..
EDEL 140C—Curriculum and Instruction .....	..	3

^{*} Art Electives must be chosen with the approval of the adviser and of the 13 credit hours required in the elementary program at least (4) must be in crafts.

SENIOR YEAR (Continued)	Semester	
	I	II
EDUC 147—Audio-Visual Ed. ....	..	3
EDEL 123—The Child and the Curriculum ....	..	3
EDEL 149C—Student Teaching in the Elementary School ..	..	8
Total	15	17

BUSINESS EDUCATION ^a

Two curricula are offered for the preparation of teachers of business subjects. The general business education curriculum qualifies for teaching all business subjects except shorthand. Providing thorough training in general business, including economics, this curriculum leads to teaching positions on both junior and senior high school levels.

The secretarial education curriculum is adapted to the needs of those who wish to become teachers of shorthand as well as other business subjects.

GENERAL BUSINESS EDUCATION

FRESHMAN YEAR

ENGL 001, 003—Composition, and American Literature ...	3	3
Fine Arts and Philosophy Requirement	3	..
SPCH 001—Public Speaking .....	..	3
BSAD 010—Elements of Business Enterprise	3	..
GEOG 015—Introduction to Economic Geography .....	..	3
MATH 010, 011—Introduction to Mathematics	3	3
ECON 004—Economic Developments	3	..
EDSE 001, 002—Principles of Typewriting and Intermediate Typewriting	2	2
PHED 002, 004 (women) PHED 001, 003 (Men)		
Physical Activities	1	1
HLTH 005—Science and Theory of Health .....	..	2
Total	18	17

SOPHOMORE YEAR

ENGL 004—World Literature	3	..
History Requirement	3	3
ECON 031, 032—Principles of Economics	3	3
EDSE 010—Office Typewriting Problems	2	..
Social Science Requirement .....	..	3
EDSE 014—Survey of Office Machines .....	..	2
BSAD 020, 021—Principles of Accounting	3	3
Science Requirement	4-3	3-4
Total	17-18	17-18

^a A minimum of 55 semester hours of courses in Economics, Business Administration and Business Education are required.

JUNIOR YEAR	Semester	
	I	II
EDUC 110—Human Development and Learning	6	..
BSAD 100—Office Operations and Management	3	..
BSAD 166—Business Communications .....	..	3
BSAD 101—Electronic Data Processing .....	..	3
BSAD 149—Marketing Principles and Organization	3	..
BSAD 180—Business Law .....	..	3
BSAD 140—Business Finance	3	..
Elect 100 level course in Economics .....	..	3
Elective .....	..	3
Total	15	15

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
BSAD 102—Electronic Data Processing Applications	3	..
EDSE 140B—Curriculum, Instruction, and Observation— Business Subjects	3	..
EDSE 145—Principles and Methods of Secondary Education .....	..	3
EDSE 100—Techniques of Teaching Office Skills .....	..	3
EDSE 148B—Student Teaching in the Secondary Schools .....	..	8
EDSE 114—Financial and Economic Education	3	..
EDSE 115—Financial and Economic Education	3	..
Total	15	14

SECRETARIAL EDUCATION CURRICULUM⁹

FRESHMAN YEAR

ENGL 001, 003—Composition, and American Literature ..	3	3
Fine Arts or Philosophy Requirements	3	..
MATH 010—Introduction to Mathematics	3	..
SPCH 001—Public Speaking .....	..	3
EDSE 001—Principles of Typewriting (If exempt, BSAD 010)	2	..
EDSE 002—Intermediate Typewriting .....	..	2
EDSE 012, 013—Principles of Shorthand I, II	3	3
Social Science Requirement .....	..	3
PHED 002, 004 (Women) PHED 001, 003 (Men) Physical Activities	1	1
HLTH 005—Science and Theory of Health .....	..	2
Total	15	17

⁹ A minimum of 55 semester hours of courses in Economics, Business Administration and Business Education are required.

SOPHOMORE YEAR	Semester	
	I	II
ENGL 004—World Literature .....	..	3
History Requirement	3	3
Science Requirement	3-4	4-3
ECON 031, 032—Principles of Economics	3	3
EDSE 010—Office Typewriting Problems	2	..
EDSE 014—Survey of Office Machines .....	..	2
EDSE 017—Advanced Shorthand and Transcription	3	..
EDSE 019—Problems in Transcription .....	..	3
Total	14-15	17-18

JUNIOR YEAR

EDUC 110—Human Development and Learning	6	..
BSAD 020, 021—Principles of Accounting	3	3
BSAD 100—Office Operations and Management	3	..
EDSE 110—Administrative Secretarial Procedures .....	..	3
BSAD 166—Business Communications .....	..	3
ECON 140—Money and Banking (or BSAD 140)	3	..
BSAD 180—Business Law .....	..	3
Elective ¹⁰ .....	..	3
Total	15	15

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
EDSE 112—Secretarial Office Practice	3	..
BSAD 101—Electronic Data Processing	3	..
EDSE 100—Techniques of Teaching Office Skills .....	..	3
EDSE 140B—Curriculum, Instruction and Observation— Business Subjects	3	..
EDSE 145—Principles and Methods of Secondary Education .....	..	3
EDSE 148B—Student Teaching in Secondary Schools .....	..	8
Elective ¹⁰ —100 Level	5	..
Total	17	14

DISTRIBUTIVE EDUCATION

FRESHMAN YEAR

ENGL 001, 003—Composition and American Literature ..	3	3
ART 010—Fine Arts	3	..
MATH 003—Fundamentals of Mathematics	3	..
Science requirement	3	4
BSAD 010—Elements of Business Enterprise	3	..
SPCH 001—Public Speaking .....	..	3
Electives .....	..	4
Health .....	..	2
PE	1	1
	16	17

¹⁰ A minimum of 55 semester hours of courses in Economics and Business Administration and in business education courses are required.

	Semester	
	I	II
SOPHOMORE YEAR		
PSYCH 001—Introduction to Psychology	3	..
History Requirement	3	3
ECON 031, 032—Principles of Economics	3	3
BSAD 020, 021—Principles of Accounting	3	3
ENGL 004—World Literature	3	..
Electives .....	..	6
	<hr/>	<hr/>
Total	15	15

JUNIOR YEAR		
BSAD 149—Marketing Principles and Organization	3	..
BSAD 150—Marketing Management .....	..	3
BSAD 160—Personnel Management I	3	..
BSAD 161—Personnel Management II .....	..	3
EDUC 110—Human Development and Learning	6	..
EDSE 123—Field Experiences: Distribution .....	..	3
EDSE 120—Organization and Coordination of DE .....	..	3
Electives	4	4
	<hr/>	<hr/>
Total	16	16

SENIOR YEAR		
ED 111—Foundations of Education	3	..
BSAD 180—Business Law	3	..
JOURN 166—Public Relations	3	..
Electives	6	..
EDSE 140—Curriculum, Instruction, and Observation:		
Distributive Education .....	..	3
EDSE 145—Principles of Secondary Education .....	..	3
EDSE 148—Student Teaching .....	..	8
	<hr/>	<hr/>
Total	15	14

ENGLISH EDUCATION

A major in English requires 51 semester hours as follows:

ENGL 001, 003, 004, 008, 115, or 116; and 150 or 151; 101; 160; and 15 hours of English electives.

Related fields: HIST 041-042 or 051-052 or 053-054; SPCH 001 and 013.

All English majors are required to have one college course in U.S. history.

FRESHMAN YEAR		
ENGL 001—Composition	3	..
Social Science Requirement	3	3
SPCH 001—Public Speaking .....	..	3
Foreign Language	3	3
Mathematics Requirement	3-4	..
Science Requirement .....	..	3-4
PHED 001, 003 (Men) PHED 002, 004 (Women)		
Physical Activities	1	1
U.S. History Requirement .....	..	3
HLTH 005—Science and Theory of Health	2	..
	<hr/>	<hr/>
Total	15-16	16-17

SOPHOMORE YEAR	Semester	
	I	II
ENGL 003, 004—World Literature	3	3
SPCH 013—Oral Interpretation .....	..	3
HIST 041, 042—Western Civilization ¹²	3	3
Foreign Language	3	3
Science Requirement	3-4	..
Fine Arts or Philosophy	3	..
ENGL 008—Introduction to English Grammar .....	..	3
Total	15-16	15

JUNIOR YEAR

EDUC 110—Human Development and Learning .....	..	6
ENGL 115 or 116—Shakespeare .....	..	3
ENGL 150 or 151—American Literature 1810-1865 <i>or</i> American Literature since 1865	3	..
ENGL 160—Advanced Expository Writing	3	..
Eng. Elective (period) .....	..	3
Eng. Elective (type)	3	..
Free Electives	6	3
Total	15	15

SENIOR YEAR

EDSE 140—Curriculum, Instruction, and Observation	3	..
EDSE 145—Principles and Methods of Secondary Education	3	..
EDSE 153—The Teaching of Reading in the Secondary Schools	3	..
EDSE 148—Student Teaching in Secondary Schools	8	..
ENGL Elective (major figure) .....	..	3
ENGL 101—History of the English Language .....	..	3
EDUC 111—Foundations of Education .....	..	3
English Electives .....	..	6
Total	17	15

FOREIGN LANGUAGE EDUCATION

The foreign language education curriculum is designed for prospective foreign language teachers in elementary and secondary schools.

Elementary Education majors are required to have a minimum of 24 semester hours in the foreign language plus EDEL 143, Foreign Language Methods in the Elementary School. College of Arts and Sciences foreign language majors and Secondary Education foreign language majors are also eligible for admission into the FLES program. Interested students should contact the Foreign Language Education adviser in the Department of Secondary Education for further information concerning the requirements for certification of FLES teachers.

¹² or HIST 051, 052 Humanities, or HIST 053, 054 History of England and Great Britain.

CLASSICAL LANGUAGE—LATIN

A minor for teaching Latin requires 24 prescribed semester hours based upon two years of high school Latin. These students should take LATN 003, 004, 005, 051, 052, 061, 101 and 102. Students who have had four years of high school Latin should begin with LATN 005, and should select two additional courses from among LATN 103, 104, or 105.

Prospective Latin teachers are urged to elect courses which relate to their teaching area: e.g. LATN 070, HIST 071, 151, 153, 155, 156; ART 060; CMLT 101, and ENGL 101.

MODERN FOREIGN LANGUAGES

All prospective foreign language teachers must take a minimum of 42 semester hours in the foreign languages including the following courses which are required for certification: one year of conversation, one year of advanced grammar and composition, one year survey of literature, one year of advanced literature (100 level) and one year of advanced civilization courses (100 level) or previously approved equivalents.

Prospective MFL teachers are urged to elect courses related to their teaching area and which will provide an integrated yet broad cultural background: e.g. LATN 070 and basic Latin courses; HIST 031, 032, 047 and 150 (for Spanish majors); HIST 041, 042, 051, 052; HIST 167, 168, 173 (for Russian majors); HIST 157, 175 (for French majors); ART 060-061; ECON 105, 106 (for Spanish majors); ECON 138 (for Russian majors); GVPT 003, 097, 101, 104 (for Spanish majors); CMLT 101, 102.

It is recommended that students who plan to teach a foreign language contact the appropriate foreign language education adviser early in their college career so that they can plan an integrated program of specialization, professional, and liberal (general) education.

FOREIGN LANGUAGE IN THE ELEMENTARY SCHOOL CURRICULUM (FLES): See Elementary Education Curriculum.

SECONDARY FOREIGN LANGUAGE EDUCATION

FRESHMAN YEAR	Semester	
	I	II
ENGL 001—Composition	3	..
ENGL 003—World Literature .....	..	3
Social Science Requirement	3	3
Science or Mathematics Requirement	3-4	3-4
SPCH 001—Public Speaking	3	..
HLTH 005—Science and Theory of Health .....	..	2
PHED 001, 003 (men) PHED 002, 004 (women)	1	1
Foreign Language 6 and 7 (or appropriate level as certified by placement test)	3	3
Total	16-17	15-16

	Semester	
	I	II
SOPHOMORE YEAR		
ENGL 004 World Literature	3	..
History Requirements	3	3
Science or Mathematics Requirement	3-4	3-4
Fine Arts or Philosophy Requirement .....	..	3
Foreign Languages 011 and 012	3	3
Electives (not in Foreign Languages)	3	3
Total	15-16	15-16
JUNIOR YEAR		
EDUC 110—Human Development and Learning	6	..
Foreign Language 041-042—Phonetics (recommended, but not required)	1	1
Foreign Language 071-072—Review Grammar and Composition	3	3
Foreign Language 075-076—Survey of Literature	3	3
Foreign Language 080-081—Advanced Conversation	3	3
Electives .....	..	6
Total	16	16
SENIOR YEAR		
EDUC 111—Foundations of Education .....	..	3
EDSE 140—Curriculum, Instruction and Observation	3	..
EDSE 145—Principles and Methods of Secondary Education	3	..
EDSE 148—Student Teaching in the Secondary Schools	8	..
Elective from EDUC 147—Audio Visual Education, EDUC 150—Educational Measurement, EDEL 153— The Teaching of Reading	3	..
Foreign Language—Advanced Literature (100 level) .....	..	6
Foreign Language 171 or 172—Civilization ¹³ .....	..	3
Elective in Foreign Language or related area (e.g. Foreign Language 100, History of France, Introduction Linguistics is recommended) .....	..	3-6
Total	14-17	15-18

HOME ECONOMICS EDUCATION

The home economics education curriculum is designed for students who are preparing to teach vocational or general home economics or to engage in any phase of home economics work which requires a knowledge of teaching methods. It includes studies of all phases of home economics and the allied sciences, with professional training for teaching these subjects. A student majoring in this curriculum may also qualify for a science minor.

The offering includes both undergraduate and graduate programs leading to the degrees of Bachelor of Science, Master of Education, and Master of Science.

¹³ Courses in related disciplines may be substituted with permission of Chairman of Foreign Language Department.

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
Social Science Requirement	3	..
HOEC 005—Intro. to Family Living through H.Ec.	2	..
FDNT 005—Food and Nutrition of Individuals and Families	3	..
APDS 001—Design .....	..	3
PHED 002, 004—Physical Activities	1	1
GVPT 001—American Government .....	..	3
SPCH 001—Public Speaking .....	..	3
HLTH 005—Science and Theory of Health	2	..
Electives .....	..	3-4
MATH 003—Fundamentals of Mathematics	4	..
Total	17-18	13-14
SOPHOMORE YEAR		
ENGL 003, 004—World Literature	3	3
HIST 021—History of U.S. to 1865 or HIST 022—History of U.S. since 1865 and HIST 041 or HIST 042—Western Civilization	3	3
APDS 020—Costume Design .....	..	3
TXCL 005—Textiles and Clothing in Contemporary Living	3	..
CLTH 010—Principles and Methods of Clothing Design ..	..	2
CHEM 011, 013 or 001, 003—General Chemistry	3-4	3-4
FOODS 010—Science Principles of Foods .....	..	3
Fine Arts or Philosophy Requirement	3	..
Total	15-16	17-18
JUNIOR YEAR		
EDSE 125—Problems in Teaching Home Ec	3	..
EDUC 110—Human Development and Learning	6	..
HMG1 050—Decision-making in Family Living	3	..
FOOD 150—Food Economics and Meal Management ....	..	3
HMG1 160—Scientific Management in the Home .....	..	3
NUTR 020 or 121—Elements of Nutrition or Science of Nutrition .....	..	3
CLTH 011—Experimental Clothing Design	2	..
ECON 037—Fundamentals of Economics .....	..	3
ZOOL 001—General Zoology	4	..
BOTN 001—General Botany .....	..	4
Total	18	16
SENIOR YEAR¹⁴		
EDSE 140E—Curric., Instruc., and Observation	3	..
EDSE 145—Principles and Methods of Secondary Ed.	3	..
EDSE 148E—Student Teaching in Secondary Schools	8	..

¹⁴ HOEC 180—Professional Seminar (Required of Seniors in the College of Home Economics).

SENIOR YEAR (Continued) ¹⁴	Semester	
	I	II
HMGT 161—Resident Experience in Home Mgt. or HMGT 165—Home Management Practicum	3	..
APDS 002—Survey of Art History or TXCL 128—Fundamentals of Home Furnishings .....	..	2-3
MICB 001—General Microbiology .....	..	4
EDUC 111—Foundations of Education .....	..	3
Electives .....	..	6-7
Total	17	15-17

MATHEMATICS EDUCATION

A major in mathematics requires the completion of MATH 022 or its equivalent and a minimum of 15 semester hours of mathematics courses at the 100 level. These 100 level courses must include MATH 103, MATH 146, and at least one of the geometry courses, MATH 120, 121, 124, 128. The remainder of the courses in mathematics are to be selected with the approval of the adviser. The mathematics major must be supported by a year of physical science, CHEM 001, and 003, or PHYS 010, 011, 015, 016 or PHYS 020 and 021.

A typical program might be as follows:

FRESHMAN YEAR

SPCH 001—Public Speaking	3	..
ENGL 001—Composition .....	..	3
Fine Arts and Philosophy Requirement .....	..	3
Social Science Requirement	3	3
Biological Science Requirement	4	..
MATH 018, 019—Introductory Analysis and Analysis I	3	4
HLTH 005—Science and Theory of Health	2	..
PHED 001, 003 (men); PHED 002, 004 (women)—Physical Activities	1	1
Electives, including Foreign Language .....	..	3
Total	16	17

SOPHOMORE YEAR

ENGL 003, 004—World Literature	3	3
History Requirement	3	3
Physical Science Requirement	4	4
MATH 020, 021—Analysis II and Analysis III	4	4
Electives, including Foreign Language	3	3
Total	17	17

¹⁴ HOEC 180—Professional Seminar (Required of Seniors in the College of Home Economics).

JUNIOR YEAR	Semester	
	I	II
MATH 022—Analysis IV	4	..
MATH 103—Introduction to Abstract Algebra .....	..	3
Math. Electives, including Geometry Requirement	3	3
EDUC 110—Human Development and Learning .....	..	6
Electives	9	3
Total	16	15

SENIOR YEAR		
EDSE 145—Principles and Methods of Secondary Education	3	..
EDSE 140—Curriculum, Instruction, and Observation—Mathematics	3	..
EDSE 148—Student Teaching in Secondary Schools—Mathematics	8	..
Education Elective	3	..
MATH 146—Fundamental Concepts of Mathematics .....	..	3
Math. Elective .....	..	3
EDUC 111—Foundations of Education .....	..	3
Electives .....	..	6
Total	17	15

MUSIC EDUCATION

The music education curriculum affords pre-service preparation in the specialized field of music education and leads to the degree of Bachelor of Science in education with a major in public school music. The curriculum provides training in both the vocal and instrumental fields of music and is planned to meet the growing demand for special teachers and supervisors in those areas. In the junior and senior years the student may elect either the vocal option or the instrumental option.

A minor in the field of Music Education may be received with 18 semester hours in music theory, history, and conducting; 14 semester hours in applied music; 2 semester hours in ensemble; 2 semester hours in music education; and student teaching divided between the student's major and minor fields.

The prescribed courses are as follows:

MUSC 001 (3); MUSC 007, 008, 070 (3,3,4); MUSC 121, 160 (3,2).

Applied Music: for vocal emphasis, 14 semester hours divided between voice and piano. For instrumental emphasis, 8 semester hours on the major instrument and 6 semester hours elected from courses in the group MUSC 061-068.

Ensemble, 2 semester hours chosen from MUSC 004, 005, 006, 009 F, 009 H, and 010. EDMU 132 (2) for vocal emphasis, or EDMU 163 (2) for instrumental emphasis.

Student teaching divided between student's major and minor fields.

MUSIC EDUCATION CURRICULUM

INSTRUMENTAL OPTION

	Semester	
	I	II
FRESHMAN YEAR		
MUSC 012, 013—Applied Music (principal instr.)	2	2
MUSC 001—Introduction to Music	3	..
MUSC 007, 008—Theory of Music	3	3
MUSC 023, 024—Class Piano	2	2
ENGL 001—Composition	..	3
SPCH 004—Voice and Diction	3	..
Social Science Requirement	3	3
MATH 003 or higher course	..	4
Total	16	17
MUSC 006—University Orchestra or MUSC 010—University Band	1	1
HLTH 005—Science and Theory of Health	2	..
PHED 001, 003 (men) 002, 004 (women)	1	1
Physical Activities	1	1
SOPHOMORE YEAR		
MUSC 052, 053—Applied Music (principal instr.)	2	2
MUSC 070, 071—Advanced Theory of Music	4	4
MUSC 061-064—(3-4 courses)	2-4	2-4
ENGL 003, 004—World Literature	3	3
BOTN 001—General Botany or ZOOL 001—General Zoology	4	..
GEOL 001—Geology or PHYS 001—Elements of Physics	..	3
Mechanics, Heat & Sound	..	3
Total	16	15
MUSC 006—Orchestra or 010—University Band	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1
JUNIOR YEAR		
MUSC 112, 113—Applied Music (principal instr.)	2	2
MUSC 120, 121—History of Music	3	3
MUSC 160, 161—Conducting	2	2
MUSC 065-068—(2-3 courses)	2	2-4
EDMU 129—Methods of Class Instrumental Instructions; and EDMU 132—Music in Secondary Schools	2	2
EDUC 110—Human Development and Learning	6	..
Electives	..	3
Total	17	16
MUSC 006—University Orchestra or 010—University Band	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1

SENIOR YEAR	Semester	
	I	II
MUSC 152—Applied Music (principal instr.)	2	..
MUSC 021—Class Voice	2	..
MUSC 147—Orchestration	2	..
EDMU 163—Band and Orchestra Techniques and Administration	..	2
EDSE 148, EDEL 149—Student Teaching	..	8
EDUC 111—Foundations of Education	3	..
EDSE 145—Prins. and Methods of Sec. Ed.	3	..
History Requirement	3	3
Total	15	13
MUSC 006—University Orchestra or 010—University Band	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1

SECONDARY MUSIC EDUCATION CURRICULUM

VOCAL OPTION

FRESHMAN YEAR		
MUSC 012, 013—Applied Music (principal instr.)	2	2
MUSC 001—Introduction to Music	3	..
MUSC 007, 008—Theory of Music	3	3
MUSC 021—Class Voice ¹⁵ MUSC 999—Applied Music (principal instr.)	2	2
MUSC 023, 024—Class Piano ¹⁶	2	2
ENGL 001—Composition	..	3
SPCH 004—Voice and Diction	3	..
Social Science Requirement	3	3
MATH 003 or higher course	..	4
Total	16	17
MUSC 004—Men's Glee Club MUSC 005—Women's Chorus	1	1
MUSC 015—University Choir	1	1
HLTH 005—Science and Theory of Health	2	..
PHED 001, 003 (men); PHED 002, 004 (women)	1	1
Physical Activities	1	1
SOPHOMORE YEAR		
MUSC 052, 053—Applied Music (principal instr.)	2	2
MUSC 031, 032—Advanced Class Voice	2	2
MUSC 033, 034—Advanced Class Piano	2	2
MUSC 070, 071—Advanced Theory of Music	4	4
ENGL 003, 004—World Lit.	3	3
BOTN 001—General Botany ZOOL 001—General Zoology	4	..
GEOG 001—Geology or PHYS 001—Elements of Physics: Mechanics, Heat and Sound	..	3
Total	17	16
MUSC 004—Men's Glee Club MUSC 005—Women's Chorus	1	1
MUSC 015—University Choir	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1

¹⁵ For voice majors.¹⁶ For piano majors.

	Semester	
	I	II
JUNIOR YEAR		
MUSC 112, 113—Applied Music (principal instr.)	2	2
MUSC 080—Class Study of String Instruments, 081—Class Study of Wind Instruments	2	2
MUSC 120, 121—History of Music	3	3
MUSC 160, 161—Conducting	2	2
EDMU 139—Music for the Elem. Sch. Specialist, and EDMU 132—Music in Sec. Schools	2	2
EDUC 110—Human Development and Learning		6
Electives	3	
Total	14	17
MUSC 004—Men's Glee Club MUSC 005—Women's Chorus		
MUSC 015—University Choir	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1
SENIOR YEAR		
MUSC 152—Applied Music (principal instr.)	2	
EDMU 173—The Vocal Music Teacher and School Organization, and EDMU 175—Methods and Materials in Vocal Music for Sec. Schools	2	2
EDSE 145—Principles and Methods of Secondary Ed., EDUC 111—Foundations of Ed.	3	3
EDSE 148, EDEL 149—Student Teaching	4	4
History requirement	3	3
Total	14	12
MUSC 004—Men's Glee Club MUSC 005—Women's Chorus		
MUSC 015—University Choir	1	1
MUSC 009 (elective)—Chamber Music Ensemble	1	1

PHYSICAL EDUCATION AND HEALTH EDUCATION

This curriculum is designed to prepare students for teaching physical education in elementary and secondary schools. To obtain full particulars on course requirements, the student should refer to the catalog of the College of Physical Education, Recreation, and Health.

SCIENCE EDUCATION

A science major consists of 52 semester hours study in the academic sciences. Students desiring a minor other than science must complete 40 hours of academic science in addition to minor requirements.

The following courses are required for all science education majors: BOTN 001—General Botany (4); CHEM 001, 003—General Chemistry (4, 4); PHYS 010, 011—Fundamentals of Physics (4, 4); and ZOOL 001—General Zoology (4); and a year of mathematics. Additional courses are selected from the academic sciences, with the approval of the student's advisor, so as to provide subject matter strength (a minimum of 36 hours) in a particular science teaching area, e.g., biology, chemistry, physics, and earth sciences.

Preparation for BIOLOGY teaching will include BOTN 001, and 002, ZOOL 001 and 002, MICB 001, Genetics (ZOOL 006 or BOTN 117), Human Anatomy and Physiology (ZOOL 014 and/or 015), a field course in both Botany and Zoology (BOTN 011, 102-103, or 153; ZOOL 121, 130 or ENTM 015), CHEM 031 and 033.

Preparation for CHEMISTRY teaching will include CHEM 001 and 003 (or 005), 015, 021, (19), 035, 036, 037, 038, and hundred-level courses from (101, 121, 125, 141, 161, 187, 192). In addition, MATH preparation should include MATH 018, 019. MATH 020, 021 are also recommended.

Preparation for PHYSICS teaching will include MATH through at least MATH 021 or the equivalent. Physics courses will include Introductory Physics with calculus (PHYS 020, 021 or PHYS 015 and 016); a lab course (PHYS 060, 061); intermediate classical (PHYS 104 through 107); modern physics (PHYS 118, 119 or 153), and additional work.

Preparation for earth science teaching will include one year of biology (BOTN 001 and ZOOL 001), one year of chemistry (CHEM 001 and CHEM 003), one year of physics (PHYS 020 and 021 preferred, or MATH 010 and 011), and at least 30 hours of earth sciences with 18 hours' concentration in one of the earth science fields and 6 hours minimum in each of two other earth science areas: GEOL 001, 002, 004, 120, 121, 198; ASTR 005, 010, 100; GEOG 010, 030, 042, 145, 146, 155, 161, 163.

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001—Composition	3	..
BOTN 001—General Botany	4	..
CHEM 001, 003—General Chemistry	4	4
MATH 018—Introductory Analysis, MATH 019— Analysis I ¹⁷	3	4
PHED 001, 003—(men); PHED 002, 004—(women) Physical Activities	1	1
ZOOL 001—General Zoology .....	..	4
HLTH 005—Science and Theory of Health .....	..	2
Total	15	15
SOPHOMORE YEAR		
ENGL 003, 004—World Literature	3	3
History requirement	3	3
PHYS 010, 011—Fundamentals of Physics or PHYS 020, 021—General Physics: Mechanics, Heat and Sound	4-5	4-5
Science	3-4	3-4
Arts or Philosophy requirement .....	..	3
SPCH 001—Public Speaking	3	..
Total	16-18	16-18

¹⁷ Or MATH 010, 011 in some cases.

JUNIOR YEAR	Semester	
	I	II
EDUC 110—Human Development and Learning .....	..	6
Science and Mathematics	12	9
Social Science requirements	3	3
Total	15	18

SENIOR YEAR		
EDSE 140—Curriculum, Instruction, and Observation ....	..	3
EDSE 145—Principles and Methods of Secondary Education ..	..	3
Elective from EDUC 150, 147, 160 .....	..	3
EDSE 148—Student Teaching in the Secondary Schools ....	..	8
EDUC 111—Foundations of Education	3	..
Science and Mathematics	12	..
Total	15	17

SOCIAL SCIENCE EDUCATION CURRICULUM

Option I (History Concentration)

Requires 54 semester hours of which at least 27 must be in history, including HIST 021, 022, 041, 042 and 12 hours of 100-level history courses including HIST 199; 27 hours of related social sciences as outlined below.

At least one course in each of the following areas: geography, sociology, (or ANTH 001) government and politics, and economics. Fifteen semester hours in any two of the following areas: economics, geography, sociology, government and politics, or psychology. One-half of these courses must be on the 100 level.

Option II (Geography Concentration)

Requires 27 semester hours in geography and 27 semester hours in history and social science. The geography requirements are GEOG 010, 011, two of GEOG 015, 030 or 042, GEOG 103 or 104, 6 hours of upper-division systematic geography, and 3 hours of regional geography. The history and social science requirements are: SOCY 001 (or ANTH 001), ECON 004, and 037, HIST 021, 022, 041 and 042, plus one 100-level history elective.

FRESHMAN YEAR	Semester	
	I	II
ENGL 001—Composition .....	..	3
SPCH 001—Public Speaking	3	..
Foreign Languages	3	3
Mathematics requirement	3-4	..
Science requirement .....	..	3-4
HIST 021, 022—History of The United States to 1865, History of The United States Since 1865	3	3
Fine Arts or Philosophy Requirement .....	..	3
HLTH 005—Science and Theory of Health	2	..
PHED 001, 003—(men); PHED 002, 004—(Women) Physical Activities	1	1
Total	15-16	16-17

	Semester	
	I	II
SOPHOMORE YEAR		
ENGL 003, 004—World Literature	3	3
HIST 041, 042—Western Civilization	3	3
GEOG 010—General Geography I	3	..
GVPT 001—American Government .....	..	3
Science requirement	3-4	..
Foreign Languages	3	3
SOCY 001—Introduction to Sociology (or Anth. 001)	3	..
ECON 004—Economic Developments .....	..	3
Total	15-16	15

JUNIOR YEAR		
ECON 031—Principles of Economics or ECON 037—Fundamentals of Economics	3	..
History electives	3	3
EDUC 110—Human Development and Learning .....	..	6
History elective (100-level)	6	3
Social Science electives	3	3
Total	15	15

SENIOR YEAR		
EDUC 111—Foundations of Education	3	..
HIST 199—Proseminar in Historical Writing	3	..
Social Science electives	6	..
Electives	3	..
EDSE 140—Curriculum, Instruction and Observation .....	..	3
EDSE 145—Principles and Methods of Secondary Education .....	..	3
Elective from EDUC 150, 147, 189 EDSE 130 .....	..	3
EDSE 148—Student Teaching in Secondary Schools .....	..	8
Total	15	17

SPEECH EDUCATION

A major in speech requires 37 semester hours. It is the policy to build a program of study in anticipation of the needs of prospective teachers in the general field of speech and drama. The following speech courses are required: SPCH 001, 002, 004, 008, 010, 021, 023, 105, plus 15 hours of electives in speech and drama (12 hours of which must be 100-level courses). A teaching minor in another field is also required. Recommended minor is English. Students desiring a B.A. degree must meet departmental foreign language requirements.

	<i>Semester</i>	
	<i>I</i>	<i>II</i>
SPCH 001—Public Speaking	3	..
ENGL 001—Composition	3	..
Social Science Requirements	3	3
Science requirement	3	3
ENGL 003—World Literature	4	..
SPCH 004A—Voice and Diction .....	..	3
History Requirement .....	..	3
PHED 001, 003 (men); PHED 002, 004 (women)		
Physical Activities	1	1
HLTH 005—Science and Theory of Health	2	..
SPCH 016—Introduction to the Theatre .....	..	3
Total	19	16
SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
SPCH 002—Advanced Public Speaking .....	..	3
SPCH 010—Group Discussion .....	..	3
Science Requirement	3	..
SPCH 008—Acting	3	..
SPCH 021—Fundamentals of Speech Communication	3	..
MATH 003—Fundamentals of Mathematics .....	..	4
History Requirement .....	..	3
Minor Requirement .....	..	3
General Elective	3	..
Total	15	16
JUNIOR YEAR		
SPCH 113—Play Production .....	..	3
EDUC 110—Human Development and Learning	6	..
SPCH 105—Handicapped School Children	3	..
Speech electives	3	3
Minor requirements	3	6
SPCH 023—Parliamentary Law	1	..
General elective .....	..	6
Total	16	18
SENIOR YEAR		
SPCH 129—Play Directing <i>or</i> SPCH 127— Children's		
Dramatics	3	..
EDSE 140—Curriculum, Instruction, and Observation .....	..	3
EDSE 145—Principles and Methods of Secondary Education .....	..	3
Elective from EDUC 150, EDUC 147, <i>or</i> EDSE 153 .....	..	3
EDSE 148—Student Teaching in Secondary Schools .....	..	8
Speech elective	3	..
Minor Requirements	6	..
EDUC 111—Foundations of Education	3	..
General Elective	3	..
Total	18	17

SPECIAL EDUCATION

This curriculum is designed for undergraduate students who wish to qualify for teaching positions in either regular elementary education or in special education. Students who complete the curriculum will receive the Bachelor of Science degree and they will meet the Maryland State Department of Education requirements for the *Standard Professional Certificate in Special Education as well as Elementary Education*. Students may pursue a sequential program in the area of the mentally retarded, the perceptually impaired (learning disabilities) and the gifted. Students interested in the Gifted program will have different programs developed for them in conjunction with the offerings in Early Childhood Education or Secondary Education.

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001 (or 021)—Composition	3	..
ENGL 003—World Literature .....	..	3
GVPT 001—American Government or		
GVPT 003—Principles of Government and Politics ...	..	3
SOC 001—Introduction to Sociology or PHIL 001—Introduction to Philosophy or PSYCH 001—Introduction to Psychology	3	..
GEOG 010—General Geography I .....	..	3
ART 040—Fundamentals of Art Education	3	..
MUSC 016—Fundamentals for the Classroom Teacher ....	..	3
BOTN 001—General Botany	4	..
ZOOL 001—General Zoology .....	..	4
PHED 001, 003 (men) or PHED 002, 004 (women)—Physical Activities	1	1
HLTH 005—Science and Theory of Health	2	..
Total	16	17
SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
HIST 021—History of the U.S. to 1865	3	..
HIST 022—History of the U.S. since 1865 .....	..	3
Physical Science: CHEM 001—General Chemistry (4) or		
GEOG 040—Principles of Meteorology (3) or		
GEOL 001—Geology (3) or ASTR 001—Introduction to ASTR or PHYS 003—Introduction to Physics (4) or CHEM 003—General Chemistry (4)	3-4	3-4
MATH 030—Elements of Mathematics	4	..
MATH 031—Elements of Geometry .....	..	4
SPCH 003—Fundamentals of General American Speech ...	..	3
Area of Concentration ¹³	3	3
Total	16-17	16-17

¹³ Students in Special Education are required to develop within their degree programs an Area of Academic Concentration consisting of a minimum of eighteen semester hours, at least twelve semester hours beyond required work in the area.



JUNIOR YEAR	Semester—	
	I	II
HIST 041 or 042—Western Civilization .....	..	3
EDUC 110—Human Development and Learning	6	..
EDEL 105-B ¹⁹ —Science in the Elementary School	2	..
EDEL 153-B ¹⁹ —The Teaching of Reading	2	..
EDEL 121-B ¹⁹ —Language Arts in the Elementary School ..	..	2
EDEL 122-B ¹⁹ —Social Studies in the Elementary School ..	..	2
EDEL 124-B ¹⁹ —Mathematics in the Elementary School .....	..	2
EDSP 170—Introduction to Special Education	3	..
EDSP 171 ²⁰ —Characteristics of Exceptional Children .....	..	3
A—Mentally Retarded or		
B—Gifted or		
C—Perceptually Impaired		
Electives, Area of Concentration	3	6
Total	16	18
SENIOR YEAR	Semester—	
	I	II
GEOG 100—Regional Geography of Eastern Anglo-America or GEOG 101—Regional Geography of Western Anglo- America or GEOG 120—Economic Geography of Europe	3	..
EDUC 111—Foundations of Education	3	..
PHED 120—Physical Education in the Elementary Schools (3) or MUED 128—Music for the Elementary Class- room Teacher (2) or EDEL 125—Art in the Elementary School (2)	2-3	..
EDSP 172—Education of Exceptional Children		
A—Mentally Retarded or		
B—Gifted or		
C—Perceptually Impaired	3	..
EDSP 173—Curriculum for Exceptional Children		
A—Mentally Retarded or		
B—Gifted	3	..
EDEL 149—Student Teaching in the Elementary School .....	..	8
EDSP 149—Student Teaching of Exceptional Children .....	..	8
Electives, Area of Concentration	3	..
Total	17-18	16
TOTAL	134-5 hours	

¹⁹ All five of these courses may not be taken in one Semester. Students will register for two in Semester I or II and the remaining three in the other semester. The distribution shown is one of the several possible distributions.

²⁰ Students in Special Education may elect one of three sequences. A-Mental Retardation, B-Gifted, C-Perceptually Impaired, but must continue in the elected sequences.

Students interested in graduate programs (Masters, Advanced Graduate Specialists and Doctoral) in Special Education are requested to consult the Graduate School catalog for appropriate information re: programs and advisers; and to consult with the office of the Department of Special Education.

Course Offerings

THE UNIVERSITY RESERVES THE RIGHT TO WITHDRAW OR DISCONTINUE ANY course for which an insufficient number of students has registered to warrant giving the course. In such an event, no fee will be charged for transfer to another course.

Courses are designated by numbers as follows:

001 to 099: courses for undergraduates.

100 to 199: courses for advanced undergraduates and graduates. (Not all courses numbered 100 to 199 may be taken for graduate credit.)

200 to 299: courses for graduates only.

300 to 399: courses for doctoral candidates and advanced graduate students.

A course with a single number extends through one semester. A course with a double number extends through two semesters. The number of credit hours is shown by the arabic numeral in parentheses after the title of the course.

A separate schedule of courses is issued each semester, giving the hours, places of meeting, and other information required by the student in making out his program. Students obtain these schedules when they register.

The symbols for the College of Education courses are as follows:

EDUC—Education, Unclassified

EDAD—Education, Administration, Supervision and Curriculum

EDCP—Education, Counseling and Personnel Services

EDEL—Education, Early Childhood-Elementary

EDHD—Education, Human Development

EDIN—Education, Industrial

EDLS—Education, Library Science

EDSE—Education, Secondary

EDMU—Education, Music

EDSP—Education, Special

EDUCATION

For Advanced Undergraduates and Graduates

EDUC 100. HISTORY OF EDUCATION IN WESTERN CIVILIZATION. (3)

Educational institutions through the ancient, medieval, and early modern periods in the western civilization, as seen against a background of socio-economic development. (Lindsay.)

EDUC 102. HISTORY OF EDUCATION IN THE UNITED STATES. (3)

A study of the origins and development of the chief features of the present system of education in the United States. (Finkelstein, Wiggin.)

EDUC 107. PHILOSOPHY OF EDUCATION. (3)

A study of the great educational philosophers and systems of thought affecting the development of modern education. (Agre, Noll.)

EDUC 108. LOGIC OF TEACHING. (3)

An analysis of the structure of basic subject matters in the curriculum and of the standard logical moves in teaching. (Agre.)

EDUC 110. HUMAN DEVELOPMENT AND LEARNING. (6)

Open only to students approved for teacher education. Studies scientific facts that describe growth, development, and learning, and the implications of these for the teacher and the school. A study of an individual child and a classroom participation experience are integral parts of the course and require a one-half day per week assignment in a public school as a teacher aide. Students are scheduled for field assignments in an elementary or high school according to the curriculum they are in. Each group is under the supervision of a faculty member with whom it meets every second week in a seminar session. (Staff.)

EDUC 111. FOUNDATIONS OF EDUCATION. (3)

Prerequisites, EDUC 110, completion of at least 90 hours, and approval for admission to teacher education. Historical, social, cultural and philosophical foundations of American education. Considers education as a profession, and the organizational structure, operation and function of modern school systems. Comparative education and contemporary issues are included. (Staff.)

EDUC 147. AUDIO-VISUAL EDUCATION. (3)

First semester and summer session. Sensory impressions in their relation to learning projection apparatus, its cost and operation; slides, filmstrips, and films, physical principles underlying projection; auditory aids to instruction; field trips; pictures, models, and graphic materials; integration of sensory aids with organized instruction. Recommended for all education students.

(Maley, Schramm, Wedberg.)

EDUC 148. INSTRUCTIONAL MEDIA SERVICES. (3)

Prerequisites: Teaching experience and EDUC 147, or equivalent. Procedures for coordinating instructional media programs; instructional materials acquisition, storage, scheduling, distribution, production, evaluation, and other service responsibilities; instructional materials center staff coordination of research, curriculum improvement, and faculty development programs. (Staff.)

EDUC 149. PROGRAMMED INSTRUCTION. (3)

Analysis of programmed instruction techniques; selection, utilization, and evaluation of existing programs and teaching machines; developing learning objectives; writing and validating programs. (Staff.)

EDUC 150. EDUCATIONAL MEASUREMENT. (3)

First and second semesters; summer session. Constructing and interpreting measures of achievement. (Staff.)

EDUC 151. STATISTICAL METHODS IN EDUCATION. (3)

Designed as a first course in statistics for students in education. Emphasis is upon educational applications of descriptive statistics, including measures of central tendency, variability, and association. (Staff.)

EDUC 155. LABORATORY PRACTICES IN READING. (2-4)

Prerequisite, EDEL 153 or EDUC 157. A laboratory course in which each student has one or more pupils for analysis and instruction. At least one class meeting per week to diagnose individual cases and to plan instruction.

(Brigham, Sullivan, Wilson.)

EDUC 157. CORRECTIVE-REMEDIAL READING INSTRUCTION. (3)

Prerequisite, EDEL 153 or equivalent. For teachers, supervisors, and administrators who wish to identify and assist pupils with reading difficulties. Concerned with diagnostic techniques, instructional materials, and teaching procedures useful in the regular classroom.

(Brigham, Sullivan, Wilson.)

EDUC 160. EDUCATIONAL SOCIOLOGY. (3)

Deals with data of the social sciences which are germane to the work of teachers. Implications of democratic ideology for educational endeavor, educational tasks imposed by changes in population and technological trends, the welfare status of pupils, the socio-economic attitudes of individuals who control the schools, and other elements of community background.

(Grambs, Huden.)

EDUC 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

A. Adult Education

B. Foundations

C. Higher Education

D. Research Design, Statistics, Measurement

Prerequisites, at least six semester hours in education at the University of Maryland plus such other prerequisites as may be set by the major area in which the experience is to be taken. Planned field experience may be provided for selected students who have had teaching experience and whose application for such field experience has been approved by the Education faculty. Field experience is offered in a given area to both major and non-major students.

Note: The total number of credits which a student may earn in EDUC 187, EDUC 224, and EDUC 287 is limited to a maximum of twenty (20) semester hours.

(Staff.)

EDUC 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

Prerequisites, consent of instructor. Available only to mature students who have definite plans for individual study of approved problems. *Course cards must have the title of the problem and the name of the faculty member who has approved it.*

(Staff.)

EDUC 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)

The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals, and supervisors.

(Staff.)

*For Graduates***EDUC 202. THE JUNIOR COLLEGE. (3)**

The philosophy and development of the junior college in the United States with emphasis on curriculum and administrative controls. Special attention is

devoted to the importance, need, place, and development of the technical-terminal or semi-professional curricula. (Kelsey.)

EDUC 203. PROBLEMS IN HIGHER EDUCATION. (3)
A study of present problems in higher education. (Kelsey.)

EDUC 204. SEMINAR IN EDUCATIONAL SOCIOLOGY. (2)
(Grambs.)

EDUC 205. COMPARATIVE EDUCATION. (3)
A study of historical changes in ways of looking at national school systems, and of problems in assessing their effectiveness. (Lindsay, Male.)

EDUC 206. SEMINAR IN COMPARATIVE EDUCATION. (2)
(Lindsay, Male.)

EDUC 207. SEMINAR IN HISTORY AND PHILOSOPHY OF EDUCATION. (2)
(Staff.)

EDUC 208. ANALYSIS OF EDUCATIONAL CONCEPTS. (3)
Application of techniques of conceptual analysis to selected concepts in education. Mental health, adjustment, creativity, and understanding are among the concepts considered. (Agre.)

EDUC 209. ADULT EDUCATION. (3)
A study of adult education in the United States, with attention to adult abilities and intelligence, programs of adult education, and a rationale for adult education. (Staff.)

EDUC 224. APPRENTICESHIP IN EDUCATION. (1-9)
A. Adult Education
B. Foundations
C. Higher Education
D. Research Design, Statistics, Measurement

Apprenticeships in the major area of study are available to selected students whose application for an apprenticeship has been approved by the Education faculty. Each apprentice is assigned to work for at least a semester full-time or the equivalent with an appropriate staff member of a cooperating school, school system or educational institution or agency. The sponsor of the apprentice maintains a close working relationship with the apprentice and the other persons involved. Prerequisites, teaching experience, a master's degree in education, and at least six semester hours in education at the University of Maryland. (Staff.)

Note: The total number of credits which a student may earn in EDUC 187, EDUC 224, and EDUC 287 is limited to a maximum of twenty (20) semester hours.

EDUC 230. MEDIATED INSTRUCTIONAL SYSTEMS. (3)
Prerequisites: EDUC 147 and EDUC 149. Theoretical and pragmatic determinants in the selection of media systems for improving teaching-learning efficiency; development and evaluation of teaching-learning units for large-group, small-group, and self-instructional presentation; integration of print and non-print media with team teaching techniques. Review of related research. (Staff.)

EDUC 231. PRACTICUM IN INSTRUCTIONAL SYSTEMS. (2-6)
Prerequisite: EDUC 230. Design and application of an experimental instructional system to a problem in curriculum, learning, or research. Each student

will work with school or college instructors in the development, use, and evaluation of an instructional media system to solve a specific instructional problem in the field. (Staff.)

EDUC 232. SEMINAR IN EDUCATIONAL TECHNOLOGY RESEARCH AND THEORY. (2)
Prerequisite: EDUC 230. Review of the literature, including the mass media of communications as they relate to the instructional process; learning theory implications, sociological, and economic considerations as they relate to current and future mediated instructional systems. (Staff.)

EDUC 237. CURRICULUM THEORY AND RESEARCH. (2)
The school curriculum considered within the totality of factors affecting pupil behavior patterns, an analysis of research contributing to the development of curriculum theory, a study curriculum theory as basic to improved curriculum design, the function of theory in guiding research, and the construction of theory through the utilization of concepts from the behavior research disciplines. (Hovet.)

EDUC 241. PROBLEMS IN THE TEACHING OF READING. (3)
A. Elementary Schools B. Secondary Schools
Implications of current theory and the results of research for the teaching of reading. Attention is given to all areas of development reading instruction, with special emphasis on persistent problems. (Hall, Zachary.)

EDUC 245. INTRODUCTION TO RESEARCH. (2)
Intensive reading, analysis, and interpretations of research, applications to teaching fields; the writing of abstracts, research reports, and seminar papers. (Staff.)

EDUC 251. INTERMEDIATE STATISTICS IN EDUCATION. (3)
Prerequisite, EDUC 151 or equivalent. A study of the basic statistical techniques used for graduate research in education, including tests of significance and sampling techniques. Necessary arithmetic skills are developed as part of the course. (Staff.)

EDUC 255, 256. ADVANCED LABORATORY EXPERIENCES IN READING INSTRUCTION. (3, 3)
The first semester of the course deals with diagnostic techniques. Each participant will assist in diagnosing reading disabilities and in recommending instructional programs for individual pupils. The second semester deals with instruction of pupils with reading disabilities. Each participant will plan and execute a program of instruction for an individual or a small group, applying findings of the preliminary diagnosis. (Brigham, Sullivan, Wilson.)

EDUC. 257. DIAGNOSIS AND REMEDIATION OF READING DISABILITIES. (3)
Prerequisites, EDEL 153 and EDUC 157. For those who wish to become corrective and remedial reading specialists. Concerned with clinical techniques, instructional materials, and remedial procedures useful to the reading specialist in (1) diagnosing serious reading difficulties and (2) planning programs of individual and small-group instruction. The work includes the writing of diagnostic and progress reports. (Brigham, Sullivan, Wilson.)

EDUC 262. MEASUREMENT IN PUPIL APPRAISAL. (3)
Prerequisite, EDUC 150. Study of group tests typically employed in school testing programs; discussion of evidence relating to the measurement of abilities. (Staff.)

EDUC 265. THEORY OF MEASUREMENT. (2)

Prerequisites, EDUC 150 and EDUC 151. Treats such topics as theory and techniques used in various scaling methods, test analysis, predictive accuracy of scores, and equivalence of scores. For students desiring more advanced treatment of problems. (Giblette.)

EDUC 266. PRACTICUM IN INDIVIDUAL TESTING. (3)

Prerequisites: EDUC 262, or equivalent, and consent of instructor. Intensive study of the theory, application, and interpretation of standard measures utilized in the individual assessment of abilities. Supervised practice in the administration of Binet, Wechsler, and other tests. (Staff.)

EDUC 271. ADVANCED STATISTICS IN EDUCATION. (3)

Prerequisites, EDUC 251 or equivalent. Primarily for the education student desiring more advanced work in statistical methodology. Survey of major types of statistical design in educational research; application of multivariate statistical techniques to educational problems. (Stunkard, Dayton.)

EDUC 272. SPECIAL TOPICS IN APPLIED STATISTICS IN EDUCATION. (1-4)

Prerequisites: EDUC 271, or equivalent, and consent of instructor. Designed primarily for students majoring or minoring in Research Design, Measurement, and Statistics in Education. Topics to be announced, but will typically related to the areas of advanced multivariate analysis and advanced design of experiments. (Staff.)

EDUC 275, 276. ADVANCED PROBLEMS IN ART EDUCATION. (3, 3)

These courses are centered about problems of teaching art in the elementary and secondary schools in terms of the philosophy of art education today, techniques and processes in the visual arts, and creative opportunities in the visual arts and in art education. The student also will have the opportunity to do special work centered about his problems in art education. (Staff.)

EDUC 279. SEMINAR IN ADULT EDUCATION. (2)

(Staff.)

EDUC 280. RESEARCH METHODS AND MATERIALS. (2)

Research methodology for case studies, surveys, and experiments; measurement and statistical techniques; design, form, and style for theses and research reports. Primarily for advanced students and doctoral candidates. (Stunkard.)

EDUC 281. SOURCE MATERIALS IN EDUCATION. (1-2)

Bibliography development through a study of source materials in education, special fields in education, and for seminar papers and theses. (Wiggin.)

EDUC 287. INTERNSHIP IN EDUCATION. (3-16)

- A. Adult Education
- B. Foundations
- C. Higher Education
- D. Research Design, Statistics, Measurement

Internships in the major area of study are available to selected students who have teaching experience. The following groups of students are eligible: (a) any student who has been advanced to candidacy for the doctor's degree and (b) any student who receives special approval by the Education faculty for an internship, provided that prior to taking an internship, such student shall have completed at least sixty semester hours of graduate work, including at least six semester hours in education at the University of Maryland. Each intern is assigned to work on a full-time basis for at least a semester with an appro-

priate staff member in a cooperating school system, or educational institution or agency. The internship must be taken in a school situation different from the one where the student is regularly employed. The intern's sponsor maintains a close working relationship with the intern and the other persons involved.

Note: The total number of credits which a student may earn in EDUC 187, EDUC 224, and EDUC 287 is limited to a maximum of twenty (20) semester hours. (Staff.)

EDUC 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

First and second semesters and summer session. Master's, advanced graduate specialist, or doctoral candidates who desire to pursue special research problems under the direction of their adviser may register for credit under this number. *Course card must have the title of the problem and the name of the faculty member under whom the work will be done.* (Staff.)

EDUC 290. DOCTORAL SEMINAR. (1-3)

Prerequisite, passing the preliminary examination for a doctor's degree in education or recommendation of a doctoral adviser. Analysis of doctoral projects and theses, and of other ongoing research projects. A doctoral candidate may participate in the Seminar during as many University sessions as he desires, but may earn no more than three semester hours of credit in the Seminar. An Ed.D. candidate may earn in total no more than nine semester hours, and a Ph.D. candidate, no more than eighteen semester hours, in the Seminar and in EDUC 399. (Dayton, Hovet, Stunkard.)

EDUC 302. CURRICULUM IN HIGHER EDUCATION. (3)

An analysis of research in curriculum and of conditions affecting curriculum change, with examination of issues in curriculum making based upon the history of higher education curriculum development. (Kelsey.)

EDUC 303. ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION. (3)

Organization and administration of higher education at the local, state, and federal levels; and an analysis of administrative relationships and functions and their effects on curriculum and instruction. (Wiggin.)

EDUC 305. COLLEGE TEACHING. (3)

Various methods of college instruction analyzed in relation to the curriculum and psychological basis. These would include the case study method, the demonstration method, the lecture method, the recitation method, teaching machines, teaching by television, and other teaching aids. (Kelsey and Staff.)

EDUC 309. SEMINAR IN PROBLEMS OF HIGHER EDUCATION. (2)

(Kelsey.)

EDUC 399. RESEARCH—THESIS (Credits Variable).

Registration required to the extent of 6 hours for master's thesis; 6-9 hours for a doctoral project; and 12-18 hours for a doctoral dissertation. (Staff.)

ADMINISTRATION, SUPERVISION AND CURRICULUM

EDAD 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

See EDUC 189 for description.

(Staff.)

EDAD 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

See EDUC 188 for description.

(Staff.)

- EDAD 189. WORKSHOPS, CLINICS, INSTITUTES. (1-6)**
See EDUC 189 for description. (Staff.)
- EDAD 210. THE ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION. (3)**
The basic course in school administration deals with the organization and administration of school systems—at the local, state, and federal levels; and with the administrative relationships involved.
(Dudley, Newell, van Zwoll, McLoone.)
- EDAD 211. THE ORGANIZATION AND ADMINISTRATION OF SECONDARY SCHOOLS. (3)**
Prerequisite, EDAD 210 or consent of instructor. The work of the secondary school principal. Includes topics such as personnel problems, school-community relationships, student activities, schedule making, and internal financial accounting.
(J. P. Anderson.)
- EDAD 212. SCHOOL FINANCE AND BUSINESS ADMINISTRATION. (3)**
An introduction to principles and practices in the administration of the public school finance activity. Sources of tax revenue, the budget, and the function of finance in the educational program are considered.
(McLoone, van Zwoll.)
- EDAD 214. SCHOOL PLANT PLANNING. (2-3)**
An orientation course in which the planning of school buildings is developed as educational designing with reference to problems of site, buildings facilities, and equipment.
(van Zwoll.)
- EDAD 216. PUBLIC SCHOOL SUPERVISION. (3)**
The nature and functions of supervision; various supervisory techniques and procedures; human relationship factors; and personal qualities for supervision.
(Dudley, J. P. Anderson, Neville, Berman.)
- EDAD 217. ADMINISTRATION AND SUPERVISION IN ELEMENTARY SCHOOLS. (3)**
Problems in administering elementary schools and improving instruction.
(Dudley.)
- EDAD 218. SCHOOL SURVEYS. (2-6)**
Prerequisite, consent of instructor. Includes study of school surveys with emphasis on problems of school organization and administration, finance and school plant planning. Field work in school surveys is required.
(Staff.)
- EDAD 221. ADVANCED SCHOOL PLANT PLANNING. (2)**
EDAD 214 is a prerequisite to this course. However, students with necessary background may be admitted without completion of EDAD 214. This is an advanced course in school plant planning problems. Emphasis is given to analysis of the educational program and planning of physical facilities to accommodate that program.
(van Zwoll.)
- EDAD 223. PRACTICUM IN PERSONNEL RELATIONSHIPS. (2-6)**
Prerequisite, masters degree or consent of instructor. Prerequisite may be waived with advisor's approval. Enrollment limited. Designed to help teachers, school administrators, and other school staff members to learn to function more effectively in developing educational policy in group situations. Each student in the course is required to be working concurrently in the field with a group of school staff members or citizens on actual school problems.
(Newell.)
- EDAD 224. APPRENTICESHIP IN EDUCATION. (1-9)**
See EDUC 224 for course description. (Staff.)

EDAD 225. SCHOOL PUBLIC RELATIONS. (3)

A study of the interrelationship between the community and the school. Public opinion, propaganda, and the ways in which various specified agents and agencies within the school have a part in the school public relations program are explored. (van Zwoll.)

EDAD 226. CHILD ACCOUNTING. (2)

An inquiry into the record keeping activities of the school system, including an examination of the marking system. (van Zwoll.)

EDAD 227. PUBLIC SCHOOL PERSONNEL ADMINISTRATION. (3)

A comparison of practices with principles governing the satisfaction of school personnel needs, including a study of tenure, salary schedules, supervision, rewards, and other benefits. (van Zwoll.)

EDAD 234. THE SCHOOL CURRICULUM. (2-3)

A foundations course embracing the curriculum as a whole from early childhood through adolescence, including a review of historical developments, an analysis of conditions affecting curriculum change, and examination of issues in curriculum making, and a consideration of current trends in curriculum design. (Berman, Hovet.)

EDAD 235. PRINCIPLES OF CURRICULUM DEVELOPMENT. (3)

Curriculum planning, improvement, and evaluation in the schools; principles for the selection and organization of the content and learning experiences; ways of working in classroom and school on curriculum improvement. (Neville, V. Anderson, Berman.)

EDAD 249. SEMINAR IN EDUCATIONAL ADMINISTRATION AND SUPERVISION. (2-4)

Prerequisite, at least four hours in educational administration and supervision or consent of instructor. A student may register for two hours and may take the seminar a second time for an additional two hours. (Staff.)

EDAD 287. INTERNSHIP IN EDUCATION. (3-16)

See EDUC 287 for course description. (Staff.)

EDAD 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

See EDUC 288 for course description. (Staff.)

EDAD 399. RESEARCH—THESIS. (Credits Variable)

See EDUC 399 for course description. (Staff.)

COUNSELING AND PERSONNEL SERVICES

EDCP 161. INTRODUCTION TO COUNSELING AND PERSONNEL SERVICES. (3)

Presents principles and procedures, and examines the functions of counselors, psychologists in schools, school social workers, and other personnel service workers. (Staff.)

EDCP 165. INTRODUCTION TO REHABILITATION COUNSELING. (3) (formerly Ed. 182)

Introductory course for majors in rehabilitation counseling, social work, psychology or education who desire to work professionally with physically or emotionally handicapped persons. (Ehrle, Lawrence.)

EDCP 172. MENTAL HYGIENE IN THE CLASSROOM. (3) (formerly Ed. 162)

The practical application of the principles of mental hygiene to classroom problems. (Greenberg.)

- EDCP 187. FIELD EXPERIENCE IN COUNSELING AND PERSONNEL SERVICES. (1-4)
See EDUC 187 for description. (Staff.)
- EDCP 188. SPECIAL PROBLEMS IN COUNSELING AND PERSONNEL SERVICES. (1-3)
See EDUC 188 for description. (Staff.)
- EDCP 189. WORKSHOPS, CLINICS, INSTITUTES. (1-6)
See EDUC 189 for description. (Staff.)
- EDCP 200. INTRODUCTION TO STUDENT PERSONNEL. (2) (formerly Ed. 228)
Prerequisite, consent of instructor. (Same as PSYC 224.) A systematic analysis of research and theoretical literature on a variety of major problems in the organization and administration of student personnel services in higher education. Included will be discussion of such topics as the student personnel philosophy in education, counseling services, discipline, housing student activities, financial aid, health, remedial services, etc. (Marx.)
- EDCP 224. APPRENTICESHIP IN COUNSELING AND PERSONNEL SERVICES. (1-9)
See EDUC 224 for description. (Staff.)
- EDCP 240. PSYCHO-SOCIAL ASPECTS OF DISABILITY. (3) (formerly Ed. 283)
Prerequisite, EDCP 165 or consent of instructor. This course is part of the core curriculum for rehabilitation counselors. It is designed to develop an understanding of the nature and importance of the personal and psycho-social aspects of adult disability. (Ehrle.)
- EDCP 241. STUDENT PERSONNEL AND THE COLLEGE STUDENT. (2)
(formerly Ed. 304)
A demographic study of the characteristics of college students; as well as a study of their aspirations, values, and purposes. (Draeger.)
- EDCP 243. OCCUPATIONAL CHOICE THEORY AND INFORMATION. (3)
(formerly Ed. 253)
Prerequisite, EDCP 161. Research and theory related to occupational and educational decisions; school programs of related information and other activities in occupational decision. (Rhoads, Byrne.)
- EDCP 244, 245. MEDICAL ASPECTS OF DISABILITY I, II. (3, 3)
(formerly Ed. 284, 285)
Prerequisite, EDCP 165 or consent of instructor. Part of the core curriculum for rehabilitation counselors. It is designed to develop an understanding of the prognosis and complications of disease processes and disorders and a knowledge of treatment measures so that realistic vocational rehabilitation goals may be developed. (Duke.)
- EDCP 249. PERSONALITY THEORIES IN COUNSELING AND PERSONNEL SERVICES. (3)
Prerequisite, consent of instructor. Examination of constructs and research relating to major personality theories with emphasis on their significance for educators working with the behavior of individuals in school settings. (Greenberg.)
- EDCP 250. CASES IN APPRAISAL. (3)
Prerequisite, EDUC 262. Collecting and interpreting non-standardized pupil appraisal data; synthesis of all types of data through case study procedures. (Ray, Woody.)
- EDCP 254. ORGANIZATION AND ADMINISTRATION OF PERSONNEL SERVICES. (2)
Prerequisite, EDCP 261 or permission of instructor. Instilling the personnel services point of view and implementing personnel services practices. (Greenberg.)

EDCP 260. COUNSELING: THEORETICAL FOUNDATIONS AND PRACTICE. (3)

Prerequisite, EDCP 250. Exploration of learning theories as applied to counseling in school, and practices which stem from such theories. (Marx, Woody.)

EDCP 261. PRACTICUM IN COUNSELING. (2-6)

Prerequisites, EDCP 260 and permission of instructor. Sequence of supervised counseling experiences of increasing complexity. Limited to eight applicants in advance. Two hour class plus laboratory. (Staff.)

EDCP 263, 264. MODIFICATION OF HUMAN BEHAVIOR: LABORATORY AND PRACTICUM. (3, 3)

First and second semesters. Application of methods relevant to behavior change in counseling and psychotherapy. Individual supervision and group consultation. (Magoon.)

EDCP 265. COUNSELING IN ELEMENTARY SCHOOLS. (3) (formerly Ed. 259)

Prerequisite, EDCP 250 or consent of instructor. Counseling theory and practices as related to children. Emphasis will be placed on an awareness of the child's total behavior as well as on specific methods of communicating with the child through techniques of play interviews, observations, and the use of non-parametric data. (Greenberg.)

EDCP 271. COUNSELING AND PERSONNEL SERVICES SEMINAR. (2) (formerly Ed. 269)

Enrollment by permission of instructor. (Marx, Peterson.)

EDCP 272. SEMINAR IN STUDENT PERSONNEL. (2-6) (formerly Ed. 310)

An intensive study of the various student personnel functions. A means to integrate the knowledge from various fields as they relate to student personnel administration. (Marx.)

EDCP 273. SEMINAR IN REHABILITATION COUNSELING. (2) (formerly Ed. 286)

(Ehrle, Lawrence.)

EDCP 287. INTERNSHIP IN COUNSELING AND PERSONNEL SERVICES. (3-16)

See EDUC 287 for description. (Staff.)

EDCP 288. SPECIAL PROBLEMS IN COUNSELING AND PERSONNEL SERVICES. (1-6)

See EDUC 288 for description. (Staff.)

EDCP 399. RESEARCH—THESIS. (Credits Variable)

See EDUC 399 for description. (Staff.)

EARLY CHILDHOOD ELEMENTARY EDUCATION

Courses Primarily for Freshmen and Sophomores

EDEL 52. INTRODUCTION TO CHILDREN'S LITERATURE. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2)

Prerequisites, ENGL 001, 003 and 004. A survey of literary materials for children and young people. Appropriate books for preschool, elementary, and junior high school pupils are considered, including picture-story, fiction, folk-lore, poetry, and informational books. Integrating literature with the curriculum, and methods of using books with children in the classroom. Aids and criteria for selection. (Amershek, E. Anderson, D. Brown, Roderick, Zachary.)

*For Advanced Undergraduates***EDEL 105. SCIENCE IN THE ELEMENTARY SCHOOL. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2-3)**

Designed to help teachers acquire general science understandings and to develop teaching materials for practical use in classrooms. Includes experiments, demonstrations, constructions, observations, field trips, and use of audio-visual materials. The emphasis is on content and method related to science units in common use in elementary schools. Formerly Sci. Ed. 105. (Blough, Eley, Williams.)

EDEL 115. ACTIVITIES AND MATERIALS IN EARLY CHILDHOOD EDUCATION. (3)

First and second semesters. Prerequisites, EDUC 110 (or concurrent enrollment). Storytelling, selection of books, the use, preparation, and presentation of such raw materials as clay, paints (easel and finger), blocks, wood, and scrap materials. (Stant.)

EDEL 116. MUSIC IN EARLY CHILDHOOD EDUCATION. (3)

First and second semesters. Prerequisite, MUSC 016 or equivalent. Creative experiences in songs and rhythms, correlation of music and everyday teaching with the abilities and development of each level; study of songs and materials; observation and teaching experience with each age level. (Shelley.)

EDEL 121. LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2-3)

Teaching of spelling, handwriting, oral and written expression, and creative expression. (McCuaig, Roderick, Schumacher, Zachary.)

EDEL 122. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2-3)

Consideration given to curriculum, organization and methods of teaching, evaluation of newer materials, and utilization of environmental resources. (Duffey, Herman, O'Neill, Potterfield, Weaver.)

EDEL 123. THE CHILD AND THE CURRICULUM. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2-3)

Relationship of the elementary school curriculum to child growth and development. Recent trends in curriculum organization; the effect of environment on learning; readiness to learn; and adapting curriculum content and methods to maturity levels of children. (Hymes, Staff.)

EDEL 125. ART IN THE ELEMENTARY SCHOOL. (2-3)

Concerned with art methods and materials for elementary schools. Includes laboratory experiences with materials appropriate for elementary schools. (Lembach, Longley.)

EDEL 126. MATHEMATICS IN THE ELEMENTARY SCHOOL. A.—EARLY CHILDHOOD; B.—ELEMENTARY. (2-3)

Emphasis on materials and procedures which help pupils sense arithmetical meanings and relationships. Helps teachers gain a better understanding of the number system and arithmetical processes. (Ashlock, Martin, Schindler.)

EDEL 127. TEACHING IN THE ELEMENTARY SCHOOL. A.—NURSERY SCHOOL AND KINDERGARTEN; B.—ELEMENTARY SCHOOL. (2-6)

An overview of elementary school teaching designed for individuals without specific preparation for elementary school teaching or for individuals without recent teaching experience. (Staff.)

EDEL 140. CURRICULUM AND INSTRUCTION. A.—COOPERATIVE NURSERY SCHOOL; B.—EARLY CHILDHOOD; C.—ELEMENTARY. (3)

Philosophy of early childhood education, observation of the developmental needs at various age levels, with emphasis upon the activities, materials, and methods by which educational objectives are attained. (Staff.)

EDEL 143. FOREIGN LANGUAGE METHODS IN THE ELEMENTARY SCHOOL. (3)

Graduate credit allowed by special arrangement and adviser's approval. Registration limited and based upon approval of adviser. Methods and techniques for developmental approach to the teaching of modern foreign languages in elementary schools. Use of realia development of oral-aural skills and understanding of young children in language development are stressed. (Staff.)

EDEL 149. STUDENT TEACHING IN ELEMENTARY SCHOOLS. A.—NURSERY SCHOOL (4-8); B.—KINDERGARTEN (4-8); C.—PRIMARY (4-16); D.—ELEMENTARY (4-16); E.—LIBRARY SCIENCE. (4)

A grade point average of 2.30, a doctor's certificate indicating freedom from communicable diseases, and approval of the instructor required. Undergraduate credit only. No other courses may be taken during a full semester of student teaching. Students who register for this course serve as apprentice teachers in the schools to which they are assigned. For 16 credits full time for one semester is devoted to this work. For experienced teachers the time and credit may be reduced. May be taken for 4 hours credit in combination with a comparable student teaching assignment at the secondary level, by music education, physical education, and library science education majors with the permission of their advisers. (Staff.)

EDEL 152. LITERATURE FOR CHILDREN AND YOUNG PEOPLE, ADVANCED. (3)

Prerequisite, EDEL 052, or approval of instructor. Development of literary materials for children and young people. Timeless and ageless books, and outstanding examples of contemporary publishing. Evaluation of the contributions of individual authors and illustrators and children's book awards.

(Amershek, E. Anderson, D. Brown, Roderick, Zachary.)

EDEL 153. THE TEACHING OF READING. A.—EARLY CHILDHOOD; B.—ELEMENTARY; C.—SECONDARY. (2-3)

Concerned with the fundamentals of development reading instruction, including reading readiness, use of experience records, procedures in using basal readers, the improvement of comprehension, teaching reading in all areas of the curriculum, uses of children's literature, the program in word analysis, and procedures for determining individual needs.

(Hall, Herman, McCuaig, Sullivan, Wilson, Zachary.)

EDEL 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

See EDUC 187 for description.

(Staff.)

EDEL 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

See EDUC 188 for description.

(Staff.)

EDEL 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)

See EDUC 189 for description.

(Staff.)

*For Graduates***EDEL 200. SEMINAR IN ELEMENTARY EDUCATION. (2)**

Primarily for individuals who wish to write seminar papers. Prerequisite: at least 12 hours of graduate work in education. (O'Neill, Staff.)

EDEL 205. PROBLEMS IN TEACHING SCIENCE IN ELEMENTARY SCHOOLS. (3)

Prerequisite, EDEL 105 or approval of instructor. Provides opportunity for students to analyze the teaching of science in the elementary school through (1) the identification of problems of teaching, (2) the investigation and study of reported research related to the stated problems, and (3) the hypothesizing of methods for improving the effectiveness of elementary school science programs. Students will also have the opportunity to study and evaluate newer programs and practices in the teaching of science in the elementary school.

(Blough, Eley, Williams.)

EDEL 210. CURRICULUM PLANNING IN NURSERY-KINDERGARTEN EDUCATION. (3)

An examination of significant new developments in curriculum theory and practice.

(Leeper.)

EDEL 211. THE YOUNG CHILD IN THE COMMUNITY. (3)

Planned observation, related research, and analysis of the experiences of young children in such community centers as foster homes, orphanages, day care centers, Sunday schools, etc. One-half day a week observation required. (Hymes.)

EDEL 212. THE YOUNG CHILD IN SCHOOL. (3)

An examination of significant theory and research on the characteristics of young children which have special implications for teaching children in nursery-kindergarten groups.

(Leeper.)

EDEL 213. TEACHER-PARENT RELATIONSHIPS. (3)

A study of the methods and materials, trends, and problems in establishing close home-school relationships.

(Hymes.)

EDEL 214. INTELLECTUAL EXPERIENCES OF THE NURSERY-KINDERGARTEN CHILD. (2)

A critical examination of materials, methods and programs in such areas as reading, literature, science, mathematics, the social studies.

(Moyer.)

EDEL 215. CREATIVE EXPERIENCES OF THE NURSERY-KINDERGARTEN CHILD. (2)

A critical examination of materials, methods and programs in such areas as art, music, dance and rhythms, language, etc.

(Moyer.)

EDEL 221. PROBLEMS OF TEACHING LANGUAGE ARTS IN ELEMENTARY SCHOOLS. (3)

Prerequisite, EDEL 121 or approval of instructor. This course is designed to allow each student an opportunity (1) to analyze current issues, trends, and problems in language-arts instruction in terms of research in fundamental educational theory and the language arts, and (2) to use this analysis in effecting changes in methods and materials for classroom instruction.

(Roderick, Schumacher, Zachary.)

EDEL 222. PROBLEMS OF TEACHING SOCIAL STUDIES IN ELEMENTARY SCHOOLS. (3)

Prerequisite, EDEL 122 or approval of instructor. An examination of current literature and research reports in the social sciences and in social studies curriculum design and instruction, with an emphasis on federally-sponsored projects as well as programs designed for urban children.

(Duffey, Herman, O'Neill, Potterfield, Weaver.)

EDEL 224. APPRENTICESHIP IN EDUCATION. (1-9)

See EDUC 224 for description.

(Staff.)

EDEL 226. PROBLEMS OF TEACHING MATHEMATICS IN ELEMENTARY SCHOOLS. (3)

Prerequisite, EDEL 124 or approval of instructor. Critical examination of se-

lected theory and research in the teaching of mathematics in elementary schools.
Evaluation of instructional materials. Implications for practice.
(Ashlock, Martin, Schindler.)

EDEL 227. DIAGNOSIS AND REMEDIATION OF ARITHMETIC DISABILITIES. (3)
Prerequisite, EDEL 126 and EDUC 150 or equivalent. For those who wish to increase competency in diagnosing and correcting arithmetic disabilities. Concerned with classroom and clinical techniques, instructional materials, and remedial procedures useful to the teacher or clinician in diagnosing serious arithmetic difficulties and planning programs of individual and small-group remediation. The work includes the writing of diagnostic and progress reports.
(Ashlock.)

EDEL 287. INTERNSHIP IN EDUCATION. (3-16)
See EDUC 287 for description. (Staff.)

EDEL 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)
See EDUC 288 for description. (Staff.)

EDEL 399. RESEARCH-THESIS (credits variable)
See EDUC 399 for description. (Staff.)

HUMAN DEVELOPMENT EDUCATION

The Institute for Child Study offers a series of courses on human development and approaches to the direct study of children. Certain prerequisites are set up within the course sequences but these prerequisites are modified by the student's previous experience in direct study of children.

Undergraduate courses are designed both for prospective teachers and inservice teachers (EDHD 102, 103, 104; EDHD 112-13, 114-15, 116-17). The graduate offering contains two series. EDHD 200, 201, 202, 203 provide a basic core of four seminars for students majoring in the field, and also provide electives (beginning with EDHD 200—Introduction) for any graduate student interested in an overview of the field. The other seminars (EDHD 204 and above) are designed for emphasis in depth on the various areas of major processes and forces that shape the development and behavior of human beings, and are intended primarily for advanced graduate students. Along with most of the graduate seminars, EDHD 250 provides for concurrent application of scientific knowledge to the direct study of children as individuals and in groups.

For Advanced Undergraduates and Graduates

EDHD 102, 103, 104. CHILD DEVELOPMENT LABORATORY I, II, and III. (2, 2, 2)
These courses involve the direct study of children throughout the school year. Each participant gathers a wide body of information about an individual, presents the accumulating data from time to time to the study group for criticism and group analysis and writes an interpretation of the dynamics underlying the child's learning behavior and development. Provides opportunity for teachers in service to earn credit for participation in their own local child study group.
(Staff.)

EDHD 105. ADOLESCENT DEVELOPMENT. (3)
A study of the interplay of physical, cultural and self forces as they influence behavior, development, learning, and adjustment during adolescence. Includes observation and case study. *This course cannot be used to meet the psychological foundations requirements for teacher certification.*
(Felker.)

EDHD 106. A STUDY OF HUMAN BEHAVIOR. (3)

This course is planned for and limited to students who are not enrolled in the College of Education; and it does not satisfy the requirements of the professional Teacher Education Programs. The course is designed to introduce students to the scientific principles (physical, social and psychological) which describe human behavior, development and adjustment at all maturity levels and to use these principles in the study of individual children and youth. Each student will observe, record, and analyze the behavior of an individual throughout the semester and must have one half-day a week for this purpose. (Gardner.)

EDHD 107. GROWTH AND DEVELOPMENT IN EARLY CHILDHOOD. (3)

First and second semesters. Developmental growth of the child from the pre-natal period through the early childhood years, with implications for home and school practice. For students in other colleges of the University. (Staff.)

EDHD 112, 114. SCIENTIFIC CONCEPTS IN HUMAN DEVELOPMENT I, II. (3, 3)

Summer session. (Staff.)

EDHD 113, 115. LABORATORY IN BEHAVIOR ANALYSIS I, II. (3, 3)

Summer session. (Staff.)

EDHD 116. SCIENTIFIC CONCEPTS IN HUMAN DEVELOPMENT III. (3)

Guided reading and observation of pupils throughout the school year. Emphasis on human development concepts relating to the impact of family, school, society, and peer group on the student. Collection and analysis of data affecting learning and behavior. For in-service educators. (Not open to persons with credit in EDHD 102, 103).

EDHD 117. LABORATORY IN BEHAVIOR ANALYSIS III. (3)

Prerequisite: EDHD 116. Guided reading and observation of pupils throughout the school year. Emphasis on analysis of intrinsic aspects of learning and behavior including cognitive processes, motivation, self-concept, attitudes, and values. For in-service educators. (Not open to persons with credit in EDHD 102, 103).

EDHD 120, 121, 122. STUDY OF HUMAN DEVELOPMENT AND LEARNING IN SCHOOL SETTINGS I, II, III. (2, 2, 2)

A sequence of courses which enables in-service teachers and administrators to carry on advanced study of human development and learning principles in the continuous study and evaluation of several different phases of the school program over an extended period of time. (Staff.)

EDHD 145. GUIDANCE OF YOUNG CHILDREN. (3)

Development of an appreciation and understanding of young children from different home and community backgrounds; study of individual and group problems. (Hymes.)

EDHD 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

See EDUC 187 for description.

(Staff.)

EDHD 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

See EDUC 188 for description.

(Staff.)

EDHD 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)

See EDUC 189 for description.

(Staff.)

*For Graduates***EDHD 200. INTRODUCTION TO HUMAN DEVELOPMENT AND CHILD STUDY. (3)**

Offers a general overview of the scientific principles which describe human development and behavior and makes use of these principles in the study of individual children. Each student will observe and record the behavior of an individual child throughout the semester and must have one half-day a week for this purpose. It is basic to further work in child study and serves as a prerequisite for advanced courses where the student has not had field work or at least six weeks of workshop experience in child study. When offered during the summer intensive laboratory work with case records may be substituted for the study of an individual child.

(Hamby, Kurtz, Thompson.)

EDHD 201. BIOLOGICAL BASES OF BEHAVIOR. (3)

EDHD 200 or its equivalent must be taken before EDHD 201 or concurrently. Emphasizes that understanding human life, growth, and behavior depends on understanding the ways in which the body is able to capture, control, and expand energy. Application throughout is made to human body processes and implications for understanding and working with people.

(Chapin.)

EDHD 202. SOCIAL BASES OF BEHAVIOR. (3)

EDHD 200 or its equivalent must be taken before EDHD 202 or concurrently. Limitations learned by an individual as he grows up. These are considered in relation to the patterns of feeling and behaving which emerge as the result of growing up in one's social group.

(Rogolsky.)

EDHD 203. INTEGRATIVE BASES OF BEHAVIOR. (3)

EDHD 200 or its equivalent, EDHD 201 and EDHD 202 are prerequisite. Analyzes the organized and integrated patterns of feeling, thinking and behaving which emerge from the interaction of basic biological drives and potentials with one's unique experience growing up in a social group.

(Newman.)

EDHD 204, 205. PHYSICAL PROCESSES IN HUMAN DEVELOPMENT. (3, 3)

Prerequisite, EDHD 200 or its equivalent. Describes in some detail the major organic processes of: conception, biological inheritance; differentiation and growth of the body; capture, transportation and use of energy, perception of the environment; coordination and integration of function; adaptation to unusual demands and to frustration; normal individual variation in each of the above processes.

(Chapin.)

EDHD 206, 207. SOCIALIZATION PROCESSES IN HUMAN DEVELOPMENT I, II. (3, 3)

Prerequisite, EDHD 200 or its equivalent. Analyzes the processes by which human beings internalize the culture of the society in which they live. The major sub-cultures in the United States, their training procedures, and their characteristic human expressions in folk-knowledge, habits, attitudes, values, life-goals, and adjustment patterns are analyzed. Other cultures are examined to highlight the American way of life and to reveal its strengths and weaknesses.

(Kyle, Mershon, Kurtz.)

EDHD 208, 209. SELF PROCESSES IN HUMAN DEVELOPMENT I AND II. (3, 3)

Prerequisite, EDHD 200 or its equivalent. Analyzes the effects of the various physical and growth processes, affectional relationships, socialization processes, and peer group roles and status on the integration, development, adjustment, and realization of the individual self. This analysis includes consideration of the nature of intelligence and of the learning process; the development of skills, concepts, generalizations, symbolizations, reasoning and imagination, attitudes, values, goals and purposes; and the condition, relationships and

experiences that are essential to full human development. The more common adjustment problems experienced in our society at various maturity levels, and the adjustment mechanisms used to meet them are studied.

(Bowie, Goering, Mershon.)

EDHD 210. AFFECTIONAL RELATIONSHIPS AND PROCESSES IN HUMAN DEVELOPMENT. (3)

EDHD 200 or its equivalent must be taken before or concurrently. Describes the normal development, expression and influence of love in infancy, childhood, adolescence and adulthood. It deals with the influence of parent-child relationship involving normal acceptance, neglect, rejection, inconsistency, and over-protection upon health, learning, emotional behavior and personality adjustment and development.

(Hatfield.)

EDHD 211. PEER-CULTURE AND GROUP PROCESSES IN HUMAN DEVELOPMENT. (3)

EDHD 200 or its equivalent must be taken before or concurrently. Analyzes the processes of group formation, role-taking and status-winning. It describes the emergence of the "peer-culture" during childhood and the evolution of the child society at different maturity levels to adulthood. It analyzes the developmental tasks and adjustment problems associated with winning, belonging and playing roles in the peer group.

(Hatfield.)

EDHD 212, 214, 216. ADVANCED SCIENTIFIC CONCEPTS IN HUMAN DEVELOPMENT I, II, III. (3, 3, 3)

Summer session.

(Staff.)

EDHD 213, 215, 217. ADVANCED LABORATORY IN BEHAVIOR ANALYSIS I, II, III. (3, 3, 3)

Summer session.

(Staff.)

EDHD 221. LEARNING THEORY AND THE EDUCATIVE PROCESS I. (3)

Prerequisite: EDUC 110 or equivalent. Provides a systematic review of the major theories of learning and their impact on education. Considers factors that influence learning.

(Perkins, Larson, Milhollan.)

EDHD 222. LEARNING THEORY AND THE EDUCATIVE PROCESS II. (3)

Provides an exploration in depth of current theoretical and research developments in the field of human learning, especially as related to educational processes. Considers factors that influence learning.

(Milhollan, Perkins.)

EDHD 224. APPRENTICESHIP IN EDUCATION. (1-9)

See EDUC 224 for description.

(Staff.)

EDHD 230, 231. FIELD PROGRAM IN CHILD STUDY I AND II. (2-6)

Prerequisite, consent of instructor. Offers apprenticeship training preparing properly qualified persons to become staff members in human development workshops, consultants to child study field programs and coordinators of municipal or regional child study programs for teachers or parents. Extensive field experience is provided. In general this training is open only to persons who have passed their preliminary examinations for the doctorate with a major in human development or psychology.

(Kurtz, Thompson.)

EDHD 250a, 250b, 250c. DIRECT STUDY OF CHILDREN. (1, 1, 1)

May not be taken concurrently with EDHD 102, 103, 104, or 200. Provides the opportunity to observe and record the behavior of an individual child in a nearby school. These records will be used in conjunction with the advanced courses in human development and this course will be taken concurrently with such courses. Teachers active in their jobs while taking advanced courses in

human development may use records from their own classrooms for this course. A minimum of one year of direct observation of human behavior is required of all human development students at the master's level. This requirement may be satisfied by this course. (Staff.)

EDHD 260. SYNTHESIS OF HUMAN DEVELOPMENT CONCEPTS. (3)

Prerequisites, EDHD 204, 206 and 208. A seminar wherein advanced students work toward a personal synthesis of their own concepts in human growth and development. Emphasis is placed on seeing the dynamic interrelations between all processes in the behavior and development of an individual.

(Morgan.)

EDHD 270. SEMINARS IN SPECIAL TOPICS IN HUMAN DEVELOPMENT. (2-6)

Prerequisite, consent of the instructor. An opportunity for advanced students to focus in depth on topics of special interest growing out of their basic courses in human development.

(Morgan.)

EDHD 287. INTERNSHIP IN EDUCATION. (3-16)

See EDUC 287 for description.

(Staff.)

EDHD 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

See EDUC 288 for description.

(Staff.)

EDHD 399. RESEARCH—THESIS. (Credits Variable)

See EDUC 399 for description.

(Staff.)

INDUSTRIAL EDUCATION

EDIN 001. MECHANICAL DRAWING. (2)

Two laboratory periods a week. This course constitutes an introduction to orthographic multi-view and isometric projection. Emphasis is placed upon the visualization of an object when it is represented by a multi-view drawing and upon the making of multi-view drawings. The course carries through auxiliary views, sectional views, dimensioning, conventional representation and single stroke letters.

(Campbell.)

EDIN 002. WOODWORKING I. (3)

Six hours of laboratory per week. The course is designed to give the student an orientation into the woodworking industry with regard to materials, products, and processes while providing for skill development in the care and use of hand and power tools.

(Beatty.)

EDIN 009. INDUSTRIAL ARTS IN THE ELEMENTARY SCHOOL I. (2)

Two laboratory periods a week. A course for pre-service and in-service elementary school teachers covering construction activities in a variety of media suitable for classroom use. The work is organized on the unit basis so that the construction aspect is supplemented by reading and other investigative procedures.

(Gettle.)

EDIN 010. INDUSTRIAL ARTS IN THE ELEMENTARY SCHOOL II. (2)

Prerequisite, EDIN 009. This is a continuation of EDIN 009. Two laboratory periods a week. It provides the teacher with opportunities to develop further competence in construction activities. Some of the basic phenomena of industry

are studied, particularly those which apply to the manufacture of common products, housing, transportation and communication. (Gettle.)

EDIN 012. SHOP CALCULATIONS. (3)

Shop Calculations is designed to develop an understanding and working knowledge of the mathematical concepts related to the various aspects of industrial education. The course includes phases of algebra, geometry, trigonometry, and general mathematics as applied to shop and drawing activities. (Stough.)

EDIN 021. MECHANICAL DRAWING. (2)

Two laboratory periods a week. Prerequisite, EDIN 001. A course dealing with working drawings, machine design, pattern layouts, tracing and reproduction. Detail drawings followed by assemblies are presented. (Campbell.)

EDIN 022. WOODWORKING II. (3)

Six hours of laboratory per week. Prerequisite, EDIN 002, for industrial arts teacher education majors. The course is designed to give the student a comprehensive knowledge of machine production with emphasis on safety, industrial processes, and maintenance. (Beatty.)

EDIN 023. ARC AND GAS WELDING. (1)

One laboratory period a week. A course designed to develop a functional knowledge of the principles and use of electric and acetylene welding. Practical work is carried on in the construction of various projects using welded joints. Instruction is given in the use and care of equipment, types of welded joints, methods of welding, importance of welding processes in industry, safety consideration, etc. (Gelina.)

EDIN 024. SHEET METAL WORK. (2)

Two laboratory periods a week. Articles are made from metal in its sheet form and involve the operations of cutting, shaping, soldering, riveting, wiring, folding, seaming, beading, burning, etc. The student is required to develop his own patterns inclusive of parallel line development, radial line development, and triangulation. (Crosby.)

EDIN 026. GENERAL METAL WORK. (3)

Three two-hour laboratory periods a week. This course provides experiences in constructing items from aluminum, brass, copper, pewter, and steel. The processes included are designing, lay out, heat treating, forming, surface decorating, fastening, and assembling. The course also includes a study of the aluminum, copper, and steel industries in terms of their basic manufacturing processes. (Staff.)

EDIN 028. ELECTRICITY-ELECTRONICS I. (3)

Six hours per week. An introductory course to electricity-electronics in general, dealing with electrical circuits and wiring, the measurement of electrical energy, the theory of motors and generators, and an introduction to vacuum tubes, transistors and power supplies. (Bradley.)

EDIN 031. MECHANICAL DRAWING. (2)

Two laboratory periods a week. Prerequisites, EDIN 001 and 021. A course dealing with the topics enumerated in EDIN 021 but on a more advanced basis. The reading of prints representative of a variety of industries is a part of this course. (Luetkemeyer.)

EDIN 033. AUTOMOTIVES I. (3)

Three two-hour laboratory periods a week. Automotives I is a study of the fundamentals of internal combustion engines as applied to transportation. A

study of basic materials and methods used in the automotive industry is included. Shop practices are built around the maintenance and minor repair of automobiles and smaller motor driven apparatus. (Staff.)

EDIN 034. GRAPHIC ARTS I. (3)

Three two-hour laboratory periods a week. An introductory course involving experiences in letterpress and offset printing practices. This course includes typographical design, hand composition, proof reading, stock preparation, offset plate making, imposition, lock-up, stock preparation, presswork, linoleum, block cutting, paper marbelizing, and bookbinding. (Staff.)

EDIN 041. ARCHITECTURAL DRAWING. (2)

Two laboratory periods a week. Prerequisite, EDIN 001 or equivalent. Practical experience is provided in the design and planning of houses and other buildings. Working drawings, specifications, and blue-prints are featured. (Campbell.)

EDIN 042. WOODWORKING III. (3)

Six hours of laboratory per week. Prerequisite, EDIN 022. The course is designed to give the student a comprehensive knowledge of contemporary wood-working technology with emphasis on mass production techniques, industrial research, and materials testing. (Beatty.)

EDIN 043. AUTOMOTIVES II. (3)

Three two-hour laboratory periods a week. Prerequisite, EDIN 033. This is an advanced course in automobile construction and maintenance covering the engine, fuel system, ignition system, chassis, and power train. Shop practices are built around major repair and adjustment of the above groups. (Staff.)

EDIN 044. GRAPHIC ARTS II. (3)

Three two-hour laboratory periods a week. Prerequisite, EDIN 034. An advanced course designed to provide further experiences to letterpress and offset printing and to introduce other reproduction processes. Silk screen printing, dry print etching, mimeograph reproduction, and rubber stamp making are the new processes introduced in this course. (Staff.)

EDIN 048. ELECTRICITY-ELECTRONICS II. (3)

Six hours per week. Prerequisite, EDIN 028 or equivalent. An intermediate course designed to provide more extensive knowledge in electricity-electronics including the principles of the transmission and reception of radio waves, the applications of transistors and other semiconductors and an introduction to industrial electronics. (Bradley.)

EDIN 050. METHODS OF TEACHING. (3)

(Offered at University College Centers.) For vocational and occupational teachers of shop work and related subjects. The identification and analysis of factors essential to helping others learn; types of teaching situations and techniques; measuring results and grading student progress in shop and related technical subjects. (Maley, Chambliss)

EDIN 066. ART METAL WORK. (2)

Two laboratory periods a week. Prerequisite, EDIN 026, or equivalent. Advanced practicum. It includes methods of bowl raising and bowl ornamenting. (Crosby.)

EDIN 069. MACHINE SHOP PRACTICE I. (3)

Two three-hour laboratory periods a week. Prerequisite, EDIN 001, or equivalent. Bench work, turning, planing, milling, and drilling. Related technical information. (Bailey.)

EDIN 084. ORGANIZED AND SUPERVISED WORK EXPERIENCES. (3)

See description under EDIN 124.

(Staff.)

EDIN 089. MACHINE SHOP PRACTICE II. (2)

Two laboratory periods a week. Prerequisite, EDIN 069, or equivalent. Advanced shop practicicum in thread cutting grinding, boring, reaming, and gear cutting. Work-production methods are employed.

(Bailey.)

EDIN 101. OPERATIONAL DRAWING. (2)

Two laboratory periods a week. Prerequisite, EDIN 001, or equivalent. A comprehensive course designed to give students practice in the modern drafting methods of industry.

(Campbell.)

EDIN 105. GENERAL SHOP. (2)

Designed to meet needs in organizing and administering a secondary school shop. Students are rotated through skill and knowledge developing activities in a variety of shop areas.

(Gettle.)

EDIN 108. ELECTRICITY-ELECTRONICS III. (3)

Six hours per week. Prerequisite, EDIN 028, or equivalent. An advanced course designed to provide more extensive knowledge in electricity or electronics including the advanced theory and applications of semiconductors and the principles of the storage and transmission of electronically coded information.

(Bradley.)

EDIN 109. EXPERIMENTAL ELECTRICITY AND ELECTRONICS—A, B, C, D. (2, 2, 2, 2)

(Staff.)

EDIN 110. FOUNDRY. (1)

One laboratory period a week. Bench and floor molding and elementary core making. Theory and principles covering foundry materials, tools and appliances.

(Maley.)

EDIN 111. LABORATORY PRACTICUM IN INDUSTRIAL ARTS EDUCATION. (3)

Three two-hour laboratory periods a week. Prerequisite, eighteen semester hours of shopwork and drawing. A course devoted to the development of instructional materials and the refinement of instructional methods pertinent to the teaching of industrial arts at the secondary school level.

(Maley.)

EDIN 115. RESEARCH AND EXPERIMENTATION IN INDUSTRIAL ARTS. (3)

This is a laboratory-seminar course designed to develop persons capable of planning, directing, and evaluating effective research and experimentation procedures with the materials, products, and processes of industry.

(Maley.)

EDIN 121. INDUSTRIAL ARTS IN SPECIAL EDUCATION. (3)

Four hours laboratory per week, one hour lecture. Prerequisite, EDSP 170 and 171 or consent of instructor. This course provides experiences of a technical and theoretical nature in industrial processes applicable for classroom use. Emphasis is placed on individual research in the specific area of one major interest in special education.

(Staff.)

EDIN 124. ORGANIZED AND SUPERVISED WORK EXPERIENCES.

(3 credits for each internship period total: 6 credits). This is a work experience sequence planned for students enrolled in the curriculum, "Education for Industry." The purpose is to provide the students with opportunities for first-hand experiences with business and industry. The student is responsible for obtaining his own employment with the coordinator advising him in regard to the job opportunities which have optimum learning value. The nature of the work experience desired is outlined at the outset of employment and the

evaluations made by the student and the coordinator are based upon the planned experiences. The time basis for each internship period is 6 forty-hour weeks or 240 work hours. Any one period of internship must be served through continuous employment in a single establishment. Two internships are required. The two internships may be served with the same business or industry. The completion for credit of any period of internship requires the employer's recommendation in terms of satisfactory work and work attitudes. More complete details are found in the handbook prepared for the student of this curriculum. (Staff.)

EDIN 125, 126. INDUSTRIAL TRAINING IN INDUSTRY I, II. (3, 3)

The first course is designed to provide an overview of the function of industrial training, type of programs, organization, development and evaluation. The second course (prerequisite the first course) is designed to study specific training programs in a variety of industries, plant program visitation, training program development, and analyses of industrial training research. (Staff.)

EDIN 140 (EDUC 140). CURRICULUM, INSTRUCTION, AND OBSERVATION. (3)

Major functions and specific contributions of industrial art education; its relation to the general objectives of the junior and senior high schools, selection and organization of subject matter in terms of modern practices and needs; methods of instruction; expected outcomes; measuring results; professional standards. Twenty periods of observation. (Beatty.)

EDIN 143. INDUSTRIAL SAFETY EDUCATION I. (2)

This course deals briefly with the history and development of effective safety programs in modern industry and treats causes, effects, and values of industrial safety education inclusive of fire prevention and hazard controls. (Crosby.)

EDIN 144. INDUSTRIAL SAFETY EDUCATION II. (2)

In this course exemplary safety practices are studied through conference discussions, group demonstration, and organized plant visits to selected industrial situations. Methods of fire precautions and safety practices are emphasized. Evaluative criteria in safety programs are formulated. (Crosby.)

EDIN 148. STUDENT TEACHING IN THE SECONDARY SCHOOLS. (2-8)

First and second semesters. EDSE 148 for additional requirements. (Tierney.)

EDIN 150. TRAINING AIDS DEVELOPMENT. (3)

Study of the aids in common use as to their source and application. Special emphasis is placed on principles to be observed in making aids useful to shop teachers. Actual construction and application of such devices will be required. (Maley.)

EDIN 157. TESTS AND MEASUREMENTS. (3)

Prerequisite, EDUC 150 or consent of instructor. The construction of objective tests for occupational and vocational subjects. (Luetkemeyer, Stough.)

EDIN 160. ESSENTIALS OF DESIGN. (2)

Two laboratory periods a week. Prerequisite, EDIN 001 and basic shop work. A study of the basic principles of design and practice in their application to the construction of shop projects. (Luetkemeyer.)

EDIN 161. PRINCIPLES OF VOCATIONAL GUIDANCE. (2)

This course identifies and applies the underlying principles of guidance to the problems of educational and vocational adjustment of students. (Mietus.)

EDIN 164. LABORATORY ORGANIZATION AND MANAGEMENT. (3)

This course covers the basic elements of organizing and managing an industrial education program including the selection of equipment and the arrangement of the shop.
(Mietus, Beatty.)

EDIN 165. MODERN INDUSTRY. (3)

This course provides an overview of manufacturing industry in the American social, economic, and culture pattern. Representative basic industries are studied from the viewpoints of personnel and management organization, industrial relations, production procedures, distribution of products, and the like.
(Harrison, Chambliss.)

EDIN 166. EDUCATIONAL FOUNDATIONS OF INDUSTRIAL ARTS. (2)

A study of the factors which place industrial arts education in any well-rounded program of general education.
(Beatty.)

EDIN 167. PROBLEMS IN OCCUPATIONAL EDUCATION. (3)

The purpose of this course is to secure, assemble, organize, and interpret data relative to the scope, character, and effectiveness of occupational education.
(Chambliss.)

EDIN 169. OCCUPATIONAL ANALYSIS AND COURSE CONSTRUCTION. (3)

Provides a working knowledge of occupational and job analysis and applies the techniques in building and reorganizing courses of study for effective use in vocational and occupational schools.
(Chambliss.)

EDIN 171. HISTORY AND PRINCIPLES OF VOCATIONAL EDUCATION. (3)

An overview of the development of vocational education from primitive times to the present with special emphasis given to the vocational education movement with the American program of public education.
(Luetkemeyer.)

EDIN 175. RECENT TECHNOLOGICAL DEVELOPMENTS IN PRODUCTS AND PROCESSES. (3)

This course is designed to give the student an understanding of recent technological developments as they pertain to the products and processes of industry. The nature of the newer products and processes is studied as well as their effect upon modern industry and/or society.
(Crosby, Mietus.)

For Graduates

EDIN 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

See EDUC 187 for description.
(Staff.)

EDIN 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

See EDUC 188 for description.
(Staff.)

EDIN 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)

See EDUC 189 for description.
(Staff.)

EDIN 207. PHILOSOPHY OF INDUSTRIAL ARTS EDUCATION. (3)

This course is intended to assist the student in his development of a point of view in regard to industrial arts and its relationship with the total educational program. He should thereby, have a "yardstick" for appraising current procedures and proposals and an articulateness for his own professional area.
(Harrison.)

EDIN 214. SCHOOL SHOP PLANNING AND EQUIPMENT SELECTION. (3)

This course deals with principles involved in planning a school shop and provides opportunities for applying these principles. Facilities required in the operation of a satisfactory shop program are catalogued and appraised.

(Tierney.)

EDIN 216. SUPERVISION OF INDUSTRIAL ARTS. (2)

(Tierney.)

EDIN 220. ORGANIZATION, ADMINISTRATION AND SUPERVISION OF VOCATIONAL EDUCATION. (2)

This course surveys objectively organization, administration, supervision, curricular spread and view point, and the present status of vocational education.

(Chambliss.)

EDIN 224. APPRENTICESHIP IN EDUCATION. (1-9)

See EDUC 224 for description.

(Staff.)

EDIN 240. RESEARCH IN INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. (2)

This is a course offered by arrangement for persons who are conducting research in the areas of industrial arts and vocational education.

(Staff.)

EDIN 241. CONTENT AND METHOD OF INDUSTRIAL ARTS. (3)

Various methods and procedures used in curriculum development are examined and those suited to the field of Industrial Arts education are applied. Methods of and devices for industrial arts instruction are studied and practiced.

(Maley.)

EDIN 242. COORDINATION IN WORK-EXPERIENCE PROGRAMS. (2)

Surveys and evaluates the qualifications and duties of a teacher-coordinator in a work-experience program. Deals particularly with evolving patterns in city and county schools in Maryland, and is designed to help teacher-coordinators, guidance counselors, and others in the supervisory and administrative personnel concerned with functioning relationships of part-time cooperative education in a comprehensive educational program.

(Chambliss.)

EDIN 248. SEMINAR IN INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. (2)

(Staff.)

EDIN 250. TEACHER EDUCATION IN INDUSTRIAL ARTS. (3)

This course is intended for the Industrial Arts teacher educator at the college level. It deals with the function and historical development of Industrial Arts Teacher education. Other areas of content include administration program and program development, physical facilities and requirements, staff organization and relationships, college-secondary school relationships, philosophy and evaluation.

(Harrison, Luetkemeyer.)

EDIN 287. INTERNSHIP IN EDUCATION. (3-16)

See EDUC 287 for description.

(Staff.)

EDIN 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

See EDUC 288 for description.

(Staff.)

EDIN 399. RESEARCH—THESIS. (Credits Variable)

See EDUC 399 for description.

(Staff.)

LIBRARY SCIENCE EDUCATION

For Advanced Undergraduates

EDLS 120. INTRODUCTION TO LIBRARIANSHIP. (3)

An overview of the library profession. Development of public, academic, special, and school services. History of books and libraries. The library as a social institution. The impact of communication media on society. Philosophy of librarianship. Professional standards, organizations and publications.

(E. Anderson.)

EDLS 122. BASIC REFERENCES AND INFORMATION SOURCES. (3)

Evaluation, selection, and utilization of information sources, in subject areas, including encyclopedias, dictionaries, periodical indexes, atlases, yearbooks. Study of bibliographical methods and form.

(James.)

EDLS 126. CATALOGING AND CLASSIFICATION OF LIBRARY MATERIALS. (3)

Principals and practice in the organization of library materials. Dewey Decimal Classification, rules for the dictionary catalog, Sears subject headings. Treatment of non-book materials. Cataloging aids and tools.

(Brown.)

EDLS 128. SCHOOL LIBRARY ADMINISTRATION AND SERVICE. (3)

Acquisition, circulation, utilization and maintenance of library materials. Organization of effective school library programs. School library quarters and equipment. Publicity and exhibits. Evaluation of library services.

(James, J. Liesener.)

EDLS 130. LIBRARY MATERIALS FOR CHILDREN. (3)

Reading interests of children. Advanced study of children's literature. Survey and selection of informational materials in subject fields including: books, periodicals, films, filmstrips, records, pictures, pamphlet materials.

(D. Brown.)

EDLS 132. LIBRARY MATERIALS FOR YOUTH. (3)

Reading interests of young people. Literature for adolescents. Selection of informational materials in subject fields including: books, periodicals, films, filmstrips, records, pictures, pamphlet materials.

(E. Anderson.)

EDLS 148. STUDENT TEACHING IN SECONDARY SCHOOLS. (Directed Library Experience). (4)

See EDSE 148 for additional requirements.

EDLS 149. STUDENT TEACHING IN ELEMENTARY SCHOOLS. (Directed Library Experience). (4)

See EDEL 149 for additional requirements.

(Staff.)

SECONDARY EDUCATION

EDSE 001. PRINCIPLES OF TYPEWRITING. (2)

Five periods per week. Prerequisite, consent of instructor. The goal of this course is the attainment of the ability to operate the typewriter continuously with reasonable speed and accuracy by the use of the "touch" system.

(Mead.)

EDSE 002. INTERMEDIATE TYPEWRITING. (2)

Five periods per week. Prerequisite, minimum grade of "C" in EDSE 001 or consent of instructor. Drills for improving speed and accuracy and an introduction to office production typewriting. This course must be completed prior to enrollment in EDSE 017.

(Peters.)

EDSE 010. OFFICE TYPEWRITING PROBLEMS. (2)

Five periods per week. Prerequisite, minimum grade of "C" in EDSE 002 or consent of instructor. A course to develop the higher degree of accuracy and speed possible and to teach the advanced techniques of typewriting with special emphasis on production. (O'Neill.)

EDSE 012, 013. PRINCIPLES OF SHORTHAND. (3, 3)

Prerequisite, consent of instructor. Five periods per week. This course aims to develop the mastery of the principles of Gregg Shorthand. In EDSE 013 special emphasis is placed on developing dictation speed. (Mead.)

EDSE 014. SURVEY OF OFFICE MACHINES. (2)

Prerequisite, sophomore standing. The various types of office business machines are surveyed, their capacities and special functions compared. Skill is developed through actual use and demonstration of such machines as: accounting, duplicating, dictating and transcribing, adding and calculating, and other functional types of machines and equipment. The course is designed also to give special training in the handling of practical business problems with machine application. (Peters.)

EDSE 017. ADVANCED SHORTHAND AND TRANSCRIPTION. (3)

Prerequisite, minimum grade of "C" in EDSE 002 and EDSE 003 or consent of instructor. Seven periods per week. Emphasis is placed on vocabulary development and new matter dictation for sustained speed at the highest level possible under varying conditions. Transcription is under timed conditions with emphasis on production involving quantity and quality of finished product. (O'Neill.)

EDSE 019. PROBLEMS IN TRANSCRIPTION. (3)

Prerequisite, minimum grade of "C" in EDSE 017 or consent of instructor. Seven periods per week. A systematic development of recording skills under special and office-style dictation and transcription conditions with particular emphasis on transcriptional problems. (O'Neill.)

EDSE 100. TECHNIQUES OF TEACHING OFFICE SKILLS. (3)

First semester. An examination and evaluation of the aims, methods, and course contents of each of the office skill subjects offered in the high school curriculum. (Peters.)

EDSE 101. PROBLEMS IN TEACHING OFFICE SKILLS. (3)

Problems in development of occupational competency, achievement tests, standards of achievement, instructional materials, transcription, and the integration of office skills. (Peters.)

EDSE 102. METHODS AND MATERIALS IN TEACHING BOOKKEEPING, AND RELATED SUBJECTS. (3)

Important problems and procedures in the mastery of bookkeeping and related office knowledge and the skills including a consideration of materials and teaching procedures. (Peters.)

EDSE 104. BASIC BUSINESS EDUCATION IN THE SECONDARY SCHOOLS. (3)

Includes consideration of course objectives; subject matter selection; and methods of organizing and presenting business principles, knowledge, and practices. (Peters.)

EDSE 110. ADMINISTRATIVE SECRETARIAL PROCEDURES. (3)

Prerequisite, EDSE 018 and 019 or consent of the instructor. The nature of office work, the secretary's function in communication, inter-company and public relations, handling records, supplies and equipment; and in direction of the office

staff. Standardization and simplification of office forms and procedures in relation to correspondence, mailing, receiving callers, telephoning, handling conferences, and securing business information. Business etiquette and ethics.

(O'Neill.)

EDSE 112. SECRETARIAL OFFICE PRACTICE. (3)

Six periods per week. Prerequisite, senior standing and completion of EDSE 110. The purpose of this course is to give laboratory and office experience to senior students. A minimum of 90 hours of office experience under supervision is required. In addition, each student will prepare a written report on an original problem previously approved.

(Staff.)

EDSE 114, 115. FINANCIAL AND ECONOMIC EDUCATION. (3, 3)

Materials, resources and methods of teaching personal finances and economics in the public schools. Special attention will be directed toward the problems of teaching the consumer's role in relation to his earnings and spending power, and the need for intelligent planning and handling of personal and family resources.

(Anderson.)

EDSE 120. ORGANIZATION AND COORDINATION OF DISTRIBUTIVE EDUCATION PROGRAMS. (3)

This course deals specifically with such areas as the organization of a cooperative distributive education program; the development of an effective cooperative relationship between coordinator and training sponsor; the selection, orientation, and training of sponsors; analysis of training opportunities, reports and records; the evaluation and selection of students for part-time cooperative work assignments; and the evaluation of the program.

(Anderson.)

EDSE 121. METHODS AND MATERIALS IN DISTRIBUTIVE EDUCATION. (3)

This course covers basic methods and materials needed to teach the preparatory classroom related instruction of a one or two year distributive education program. It deals specifically with the organization of special supplementary materials for individual and group instruction—Youth Club programs, organization and administration.

(Anderson.)

EDSE 123. FIELD EXPERIENCES: DISTRIBUTION. (3)

First and second semesters and summer session. Supervised work experience in a distributive occupation to apply theory of distribution to the function of distribution as a basis for vocational teaching and guidance. By individual arrangement with adviser.

(Anderson.)

EDSE 125. PROBLEMS IN TEACHING HOME ECONOMICS. (3)

First and second semesters. Prerequisite, EDSE 140. A study of the managerial aspects of teaching and administering a home-making program; the physical environment, organization, and sequence of instructional units, resource materials, evaluation, home projects.

(Lemmon.)

EDSE 126. EVALUATION OF HOME ECONOMICS. (3)

The meaning and function of evaluation in education; the development of a plan for evaluating a homemaking program with emphasis upon types of evaluation devices, their construction, and use.

(Lemmon.)

EDSE 130. THE JUNIOR HIGH SCHOOL. (2-3)

A general overview of the junior high school. Purposes, functions and characteristics of this school unit; a study of its population, organization, program of studies, methods, staff, and other topics, together with their implications for prospective teachers.

(Grambs.)

EDSE 133.²¹ METHODS OF TEACHING SOCIAL STUDIES IN SECONDARY SCHOOLS. (2-3)
 Designed to give practical training in the everyday teaching situations. Use of various lesson techniques, audio and visual aids, reference materials, and testing programs and the adaption of teaching methods to individual and group differences. Present tendencies and aims of instruction in the social studies.

(Risinger, Farrell, Campbell.)

EDSE 134. MATERIALS AND PROCEDURES FOR THE SECONDARY SCHOOL CORE CURRICULUM. (3)

This course is designed to bring practical suggestions to teachers who are in charge of core classes in junior and senior high schools. Materials and teaching procedures for specific units of work are stressed.

(Grambs.)

EDSE 137.²¹ METHODS OF TEACHING MATHEMATICS IN SECONDARY SCHOOLS. (3)

Considers the methods and procedures for presenting secondary mathematics in a meaningful way. Special attention will be given to the new experimental materials which have been prepared for grades 7-12 and the techniques needed to teach these courses.

(Garstens, Henkelman.)

EDSE 138.²¹ METHODS OF TEACHING SCIENCE IN SECONDARY SCHOOLS. (3)

Considers such topics as the objectives, selection, organization, and presentation of subject matter, appropriate classroom methods and procedures, instructional materials and evaluation of learning experiences in the areas of science.

(Lockard.)

EDSE 139. SPEECH METHODS AND RESOURCES IN SECONDARY SCHOOLS. (3)

Practical suggestions for developing curricular and extra-curricular speech programs. Planning units and courses of study, current trends, and aims of speech education, use of printed and audio-visual materials, evaluating of performance, directed speech activities, and the teaching of listening.

(Wolvin.)

EDSE 140. CURRICULUM, INSTRUCTION, AND OBSERVATION. (3)

First and/or second semesters. Offered in separate sections for the various subject matter areas namely, English, social studies, foreign language, science, mathematics, art education, business education, home economics education, industrial education, music education, physical education, and speech education. Registration cards must include the subject-matter area as well as the name and number of the course. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks, and other instructional materials, measurement, and other topics pertinent to the particular subject matter area are treated. Twenty periods of observation. Students must reserve all day each Tuesday for observation in public schools.

(Staff.)

EDSE 141.²² METHODS OF TEACHING ENGLISH IN SECONDARY SCHOOLS. (3)

Content and method in teaching the English language arts.

(Bryan, Woolf.)

EDSE 142. TEACHING THE AUDIO-LINGUAL SKILLS IN FOREIGN LANGUAGES. (3)

Graduate credit allowed by special arrangement and adviser's approval. Designed for high school teachers. Methods in making and using tape recordings, using electronic laboratories, developing oral-aural skills and direct approach to language teaching are emphasized.

(Staff.)

²¹ This course is designed for teachers in service and is not open to regular undergraduate students.

²² These courses are designed for teachers in service and are not open to regular undergraduates.

EDSE 145. PRINCIPLES AND METHODS OF SECONDARY EDUCATION. (3)

First and second semesters; summer session. This course is concerned with the principles and methods of teaching in junior and senior high schools. Instructional problems common to all of the subject fields are considered in relation to the needs and interests of youth, the urgent social problems of today, and the central values to which our society is committed.

(Adkins, Funaro, Van Ness.)

EDSE 148. STUDENT TEACHING IN SECONDARY SCHOOLS. (2-8)

First and second semesters. In order to be admitted to a course in student teaching, a student must have an overall grade point average of 2.30, a doctor's certificate indicating that the applicant is free of communicable diseases, and the consent of the instructor to the appropriate area. He must have been previously enrolled at the University of Maryland for at least one semester. Undergraduate credit only. Application forms for this course must be submitted to the appropriate adviser by the middle of the semester preceding the one in which an assignment is desired. Students who register for this course serve as apprentice teachers in the schools to which they are assigned. For 8 credits, full time for one-half of the semester is devoted to this work. For experienced teachers and students in physical education, music education, and library science education who are planning to split student teaching assignment in elementary and secondary schools, the time and credit may be modified.

(Staff.)

EDSE 187. FIELD EXPERIENCE IN EDUCATION. (1-4)

See EDUC 187 for description.

(Staff.)

EDSE 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)

See EDUC 188 for description.

(Staff.)

EDSE 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)

See EDUC 189 for description.

(Staff.)

For Graduates

EDSE 200. ADMINISTRATION AND SUPERVISION OF BUSINESS EDUCATION. (3)

Major emphasis on departmental organization and its role in the school program, curriculum, equipment, budget-making, supervision, guidance, placement and follow-up, school-community relationships, qualifications and selection of teaching staff, visual aids and in-service programs for teacher development. For administrators, supervisors, and teachers.

(Peters.)

EDSE 205. SEMINAR IN BUSINESS EDUCATION. (2)

The study and evaluation of the literature and research in business education.

(Peters.)

EDSE 224. APPRENTICESHIP IN EDUCATION. (1-9)

See EDUC 224 for description.

(Staff.)

EDSE 239. SEMINAR IN SECONDARY EDUCATION. (2)

(Risinger, Adkins, McClure.)

EDSE 240. TRENDS IN SECONDARY SCHOOL CURRICULUM. (3)

A. English B. Foreign Languages. C. Mathematics. D. Science. E. Social Studies. F. Speech. G. General. H. Business. J. Distributive Education.

Recent developments in educational thinking and practice which have affected the curriculum in one of the specified areas.

(Staff.)



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EDSE 243. THEORY AND RESEARCH IN SECONDARY EDUCATION. (1-3)

A. English. B. Foreign Languages. C. Mathematics. D. Science. E. Social Studies. F. Speech. G. General. H. Business. J. Distributive Education. K. Home Economics. L. Art. M. Reading.

A survey of the research literature in the specified areas; evaluation of research techniques relative to subject areas; consideration of relevant instructional curriculum theory; evaluation of modern teaching methods and techniques as they apply to the specific area. One to three semester hours with a maximum of nine. Prerequisite: EDUC 245. (Staff.)

EDSE 247. SEMINAR IN SPECIAL SUBJECT AREAS. (2)

A. English. B. Foreign Languages. C. Mathematics. D. Science. E. Social Studies. F. Speech. G. Business. H. Home Economics. J. Art. K. Reading. L. Distributive Education.

An opportunity to pursue special subject area interests in curriculum construction, course of study development, or other teaching problems. Class members may work on problems related directly to their own school situations. (Staff.)

EDSE 255. PRINCIPLES AND PROBLEMS OF BUSINESS EDUCATION. (2-3)

Principles, objectives, and practices in business education; occupational foundations; current attitudes of business, labor and school leaders; general business education relation to consumer business education and to education in general. (Peters.)

EDSE 256. CURRICULUM DEVELOPMENT IN BUSINESS EDUCATION. (2-3)

This course is especially designed for graduate students interested in devoting the summer session to a concentrated study of curriculum planning in business education. Emphasis will be placed on the philosophy and objectives of the business education program, and on curriculum research and organization of appropriate course content. (Peters.)

EDSE 260. SEMINAR IN HOME ECONOMICS EDUCATION. (2)

(Lemmon.)

EDSE 261. TRENDS IN THE TEACHING AND SUPERVISION OF HOME ECONOMICS. (2-4)

Study of home economics programs and practices in light of current educational trends. Interpretation and analysis of democratic teaching procedures, outcomes of instruction and supervisory practices. (Lemmon.)

EDSE 287. INTERNSHIP IN EDUCATION. (3-16)

See EDUC 287 for description.

(Staff.)

EDSE 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

See EDUC 288 for description.

(Staff.)

EDSE 399. RESEARCH—THESIS. (CREDITS VARIABLE)

See EDUC 399 for description.

(Staff.)

MUSIC EDUCATION*For Advanced Undergraduates and Graduates***EDMU 125. CREATIVE ACTIVITIES IN THE ELEMENTARY SCHOOL. (2-3)**

Prerequisite, music methods or teaching experience. A study of the creative approach for developing music experiences for children in the elementary grades through use of contemporary music techniques and contemporary music. (Shelley.)

EDMU 128. MUSIC FOR THE ELEMENTARY CLASSROOM TEACHER. (2-3)

Prerequisite, MUSC 016 or consent of instructor. For non-music majors. A study of basic activities through which the child experiences music. The course includes an outline of objectives and a survey of instructional methods and materials.
(Blum, Shelley)

EDMU 129. METHODS AND MATERIALS FOR CLASS INSTRUMENTAL INSTRUCTION. (2)

Prerequisite, previous or concurrent registration in MUSC 061-068. Two one-hour laboratories and one lecture per week. Teaching techniques and rehearsal techniques for beginning and intermediate instrumental classes—winds, strings, and percussion.
(Staff.)

EDMU 132. MUSIC IN SECONDARY SCHOOLS. (2-3)

Prerequisite, consent of instructor. A study of the music program in the junior and senior high school with emphasis on objectives, organization of subject matter, teaching techniques and materials for general music classes.
(Blum, Shelley)

EDMU 139. MUSIC FOR THE ELEMENTARY SCHOOL SPECIALIST. (2-3)

Prerequisite, consent of instructor. Teaching techniques and instructional materials for the music program in the elementary schools. For the music specialist.
(Blum, Shelley)

EDMU 155. ORGANIZATION AND TECHNIQUE OF INSTRUMENTAL CLASS INSTRUCTION. (3)

Prerequisite, consent of instructor. Practical instruction in the methods of tone production, tuning, fingering, and in the care of woodwind and brass instruments. A survey of the materials and published methods for class instruction.
(Staff.)

EDMU 163. BAND AND ORCHESTRA TECHNIQUES AND ADMINISTRATION. (2-3)

Prerequisites, MUSC 061-068 and 161. Comprehensive study of instructional materials, rehearsal techniques, program planning, and band pageantry for the high school instrumental program. Organization, scheduling, budgeting and purchasing are included.
(Staff.)

EDMU 170. METHODS AND MATERIALS FOR CLASS PIANO INSTRUCTION. (2)

Objectives, techniques and materials for teaching class piano. Special emphasis is placed on analysis of materials, electronic pianos, and audio-visual aids.
(deVermond.)

EDMU 173. THE VOCAL MUSIC TEACHER AND SCHOOL ORGANIZATION. (2)

Prerequisite, student teaching, previous or concurrent. The role of the vocal music specialist in the implementation of the supervision and administration of the music programs in the elementary and secondary schools. Open to graduate students by permission of instructor.
(Blum.)

EDMU 175. METHODS AND MATERIALS IN VOCAL MUSIC FOR SECONDARY SCHOOLS. (2-4)

Prerequisite, consent of instructor. A survey of repertoire and methods for teaching choral groups and voice classes. Diction, interpretation, tone production, intonation, phrasing, rehearsal techniques and style characteristics are stressed.
(Grentzer, Shelley.)

EDMU 176. SPECIAL PROBLEMS IN THE TEACHING OF INSTRUMENTAL MUSIC. (2-3)

Prerequisite, MUSC 061-068 or the equivalent. A study, through practice on minor instruments, of the problems encountered in public school teaching of orchestral instruments. Literature and teaching materials, minor repairs, and

adjustment of instruments are included. The course may be taken for credit three times since one of three groups of instruments (strings, woodwind, or brass-percussion) will be studied each time the course is offered. (Staff.)

EDMU 180. INSTRUMENTAL MUSIC FOR SECONDARY SCHOOLS. (2)

Prerequisite, consent of instructor. A survey of the repertoires for high school orchestra, band, and small ensemble. Problems of interpretation, intonation, tone quality, and rehearsal techniques. The course may be repeated for credit, since different repertoires are covered each time the course is offered. (Staff.)

For Graduates

EDMU 200. RESEARCH METHODS IN MUSIC AND MUSIC EDUCATION. (3)

The application of methods of research in the fields of music and music education. Extensive survey of bibliography and source materials. Written exposition of a research project in the area of the student's specialization. (Grentzer.)

EDMU 201. ADMINISTRATION AND SUPERVISION OF MUSIC IN THE PUBLIC SCHOOLS. (3)

The study of basic principles and practice of supervision and administration with emphasis on curriculum construction, scheduling, budgets, directing of in-service teaching, personnel problems, and school-community relationships. (Grentzer.)

EDMU 204. CURRENT TRENDS IN MUSIC EDUCATION. (3)

A survey of current philosophies and objectives of music in the elementary, secondary schools, and teacher training programs. The influence of educational and social changes upon these programs. (deVermond, Grentzer)

EDMU 205. VOCAL MUSIC IN THE ELEMENTARY SCHOOLS. (3)

Advanced study of the most recent instructional materials used in the United States and Europe. Analysis of new methods for teaching music in the elementary schools. (Blum, Grentzer.)

EDMU 206. CHORAL CONDUCTING AND REPERTOIRE. (3)

The study and reading of choral literature of all periods, including the contemporary, suitable for use in school and community choruses. Style, interpretation, tone quality, diction, rehearsal and conducting techniques are analyzed. (Traver.)

EDMU 207. VOCAL MUSIC IN THE SECONDARY SCHOOLS. (3)

Analysis of current methods, basic and source materials for use in teaching general music, music in the humanities, history and appreciation of music, musical theory, and class voice. (Grentzer)

EDMU 208. THE TEACHING OF MUSIC APPRECIATION. (3)

A study of the objectives for the elementary and secondary levels; the techniques of directed listening, the presentation of theoretical and biographical materials, course planning, selection and use of audio-visual aids and library materials, and the correlation between music and other arts. (Staff.)

EDMU 209. SEMINAR IN INSTRUMENTAL MUSIC. (2)

A consideration of acoustical properties and basic techniques of the instruments. Problems of ensemble and balance, intonation, precision, and interpretation are studied. Materials and musical literature for orchestra, bands, and small ensembles are evaluated. (Staff.)

- EDMU 210. ADVANCED ORCHESTRATION AND BAND ARRANGING (SEMINAR). (2)
Prerequisite, Music 147 or the equivalent, or consent of the instructor. A study of arranging and transcription procedures in scoring for the orchestra and band. Special attention is given to the arranging problems of the instrumental director in the public schools. (Staff.)
- EDMU 250. HISTORY AND AESTHETICS OF MUSIC EDUCATION. (3)
Prerequisite, permission of instructor. The study of the development of pedagogical practices in music education, their aesthetic implications and educational values. (Grentzer.)

SPECIAL EDUCATION

For Advanced Undergraduates and Graduates

- EDSP 149. STUDENT TEACHING OF EXCEPTIONAL CHILDREN. (8)
See EDEL 149 for additional requirements. (Staff.)
- EDSP 170. INTRODUCTION TO SPECIAL EDUCATION. (3)
Designed to give an understanding of the needs of all types of exceptional children, stressing preventive and remedial measures. (Campbell, Simms, Seidman.)
- EDSP 171. CHARACTERISTICS OF EXCEPTIONAL CHILDREN. (3-9)
A. Mentally Retarded. B. Gifted. C. Perceptual Learning Problems. Prerequisite, EDSP 170 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children. (Campbell, Simms.)
- EDSP 172. EDUCATION OF EXCEPTIONAL CHILDREN. (3-9)
A. Mentally Retarded. B. Gifted. C. Perceptual Learning Problems. Prerequisite, EDSP 171 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged. (Campbell, Simms.)
- EDSP 173. CURRICULUM FOR EXCEPTIONAL CHILDREN. (3-6)
A. Mentally Retarded. B. Gifted. Prerequisite, EDSP 171 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum for these children; studies various curricula currently in use. (Campbell, Simms.)
- EDSP 175. EDUCATION OF THE SLOW LEARNER. (3)
Course content includes the characteristics of the slow learner and those educational practices which are appropriate for the child who is functioning as a slow learner. (Seidman.)

For Graduates

- EDSP 187. FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 187 for description. (Staff.)
- EDSP 188. SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 188 for description. (Staff.)
- EDSP 189. WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)
See EDUC 189 for description. (Staff.)

EDSP 200. EXCEPTIONAL CHILDREN AND YOUTH. (3)

Prerequisite, consent of instructor. Deals primarily with research relevant to the intellectual, psychological, physical, and emotional characteristics of exceptional children. (Seidman.)

EDSP 201. EMOTIONALLY HANDICAPPED CHILDREN AND YOUTH. (3)

Prerequisite, EDSP 200 and consent of instructor. Deals with epidemiology, etiology classification, diagnostic procedures, behavioral characteristics, treatment and prevention of child and adolescent disturbances. (Huber.)

EDSP 205. THE EXCEPTIONAL CHILD AND SOCIETY. (3)

Prerequisite, EDSP 200 or consent of instructor. Relationship of the role and adjustment of the child and/or adult and exceptionality to societal characteristics. (Campbell, Seidman.)

EDSP 210. ADMINISTRATION AND SUPERVISION OF SPECIAL EDUCATION PROGRAMS. (3)

Prerequisite, consent of instructor. Consideration of the determination, establishment and function of educational programs for exceptional children for administrative and supervisory personnel. (Hebeler.)

EDSP 215. EVALUATION AND MEASUREMENT OF EXCEPTIONAL CHILDREN AND YOUTH. (3)

Prerequisite, EDUC 150, 151, EDSP 200.

Deals with the understanding and interpretation of the results of psychological and educational tests applicable for use with exceptional children. (Simms, Campbell.)

EDSP 220. EDUCATIONAL DIAGNOSIS AND PLANNING FOR EXCEPTIONAL CHILDREN AND YOUTH. (3)

Prerequisite, EDSP 215. Deals with the identification of learning characteristics of exceptional children and the planning of appropriate programs. (Campbell, Simms)

EDSP 221. PSYCHO-EDUCATIONAL PROGRAMMING WITH EMOTIONALLY HANDICAPPED CHILDREN AND YOUTH. (3)

Prerequisite, EDSP 200, EDSP 201 and consent of instructor. Deals with factors pertinent to therapeutic education of disturbed children and adolescents in special treatment settings. (Huber.)

EDSP 224. APPRENTICESHIP IN EDUCATION. (1-9)

See EDUC 224 for description.

(Staff.)

EDSP 225. PROBLEMS IN THE EDUCATION OF THE MENTALLY RETARDED. (3)

Prerequisite, 9 hours EDSP including EDSP 200, or consent of instructor. Consideration of the pertinent psychological, educational, medical, sociological and other relevant research and theoretical material relevant to the determination of trends, practices, regarding the mentally retarded. (Simms.)

EDSP 230. PROBLEMS IN THE EDUCATION OF THE GIFTED. (3)

Prerequisite, 9 hours EDSP including EDSP 200 or consent of instructor. Consideration of the pertinent psychological, educational, medical, sociological and other relevant research and theoretical material relevant to the determination of trends, practices, regarding the gifted. (Hebeler, Simms)

EDSP 235. PROBLEMS IN THE EDUCATION OF CHILDREN WITH EMOTIONAL DISTURBANCES. (3)

Prerequisite, 9 hours EDSP including EDSP 200 or consent of instructor. Consideration of the pertinent psychological, educational, medical, sociological and

other relevant research and theoretical material relevant to the determination of trends, practices, regarding the emotionally disturbed. (Huber.)

EDSP 240. PROBLEMS IN THE EDUCATION OF CHILDREN WITH PERCEPTUAL IMPAIRMENT. (3)

Prerequisite, 6 hours in Education of the Perceptually Impaired, EDSP 215, and EDSP 220 or consent of instructor. Consideration of the pertinent psychological, educational, medical, sociological and other relevant research and theoretical material relevant to the determination of trends and practices regarding the perceptually impaired. (Campbell.)

EDSP 278. SEMINAR IN SPECIAL EDUCATION. (2)

Prerequisite, 9 hours in Special Education or consent of instructor. An overview of education of exceptional children. (Hebeler.)

EDSP 287. INTERNSHIP IN EDUCATION. (3-16)

See EDUC 287 for description. (Staff.)

EDSP 288. SPECIAL PROBLEMS IN EDUCATION. (1-6)

See EDUC 288 for description. (Staff.)

EDSP 399. RESEARCH—THESIS. (CREDITS VARIABLE)

See EDUC 399 for description. (Staff.)

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COLLEGE OF ENGINEERING

1968-1970

UNIVERSITY OF MARYLAND



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University Calendar, 1968-1969

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m. Christmas recess ends
	14	Tuesday	After last class—end of instruction
	16-24	Thursday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
MARCH	28	Friday	After last class—Spring recess begins
APRIL	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
AUGUST	4-8	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

*1969-1970**FALL SEMESTER, 1969*

SEPTEMBER	8-12	Monday-Friday	Fall Semester Registration
	13	Saturday	Teacher Registration
	15	Monday	Instruction begins
NOVEMBER	26	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	1	Monday	Thanksgiving recess ends
	19	Friday	After last class—Christmas recess begins

1970

JANUARY	5	Monday	Christmas recess ends
	14	Wednesday	Pre-exam Study Day
	15-22	Thursday-Thursday	Fall Semester examinations

SPRING SEMESTER, 1970

FEBRUARY	2-6	Monday-Friday	Spring Semester Registration
	7	Saturday	Teacher Registration
	9	Monday	Instruction begins
MARCH	26	Thursday	After last class—Spring recess begins
APRIL	6	Monday	8:00 a.m.—Spring recess ends
MAY	27	Wednesday	Pre-exam Study Day
	28-June 5	Thursday-Friday	Spring Semester Examinations
JUNE	1	Monday	Memorial Day
	6	Saturday	Commencement

SUMMER SESSION, 1970

JUNE	22-23	Monday-Tuesday	Summer Registration
JUNE	24	Wednesday	Instruction begins
AUGUST	14	Friday	Summer Session ends

SHORT COURSES, 1970

JUNE	15-18	Monday-Thursday	College Week for Women
AUGUST	3-7	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	8-11	Tuesday-Friday	Fireman's Short Course

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DIRECTOR (ACTING), INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS

Thomas D. Wilkerson—*B.S.*, *University of Michigan*, 1953; *M.S.*, 1954; *Ph.D.*, 1962.

DIRECTOR OF LIBRARIES

Howard Rovelstad—*B.A.*, *University of Illinois*, 1936; *M.A.*, 1937; *B.S.L.S.*, *Columbia University*, 1940.

DIRECTOR, NATURAL RESOURCES INSTITUTE

L. Eugene Cronin—*A.B.*, *Western Maryland College*, 1938; *M.S.*, *University of Maryland*, 1943; *Ph.D.*, 1946.

DIRECTOR, THE PSYCHIATRIC INSTITUTE

Eugene B. Brody—*A.B.*, *M.A.*, *University of Missouri*, 1941; *M.D.*, *Harvard University*, 1944.

DIRECTOR, SUMMER SCHOOL

Clodus R. Smith—*B.S.*, *Oklahoma State University*, 1960; *M.S.*, 1955; *Ed.D.*, *Cornell University*, 1960.

DIRECTOR, PROFESSIONAL AND SUPPORTING SERVICES, UNIVERSITY HOSPITAL

George H. Yeager—*B.S.*, *University of West Virginia*, 1925; *M.D.*, *University of Maryland*, 1929.

General Administrative Officers

ADMINISTRATIVE DIRECTOR, OFFICE OF STUDENT AFFAIRS

Francis A. Gray, Jr.—*B.S.*, *University of Maryland*, 1943.

ASSISTANT FOR FACILITIES PLANNING

Robert E. Kendig—*A.B.*, *College of William and Mary*, 1939; *M.A.*, *George Washington University*, 1965.

DIRECTOR OF ENDOWMENT AND GIFTS

Richard D. Wagner—*B.S., Bradley University, 1960; M.P.A., University of Pittsburgh, 1962; Ph.D., 1967.*

COMPTROLLER AND BUDGET OFFICER

Harry D. Fisher—*B.S., University of Maryland, 1943; C.P.A., 1948.*

DIRECTOR, ADMISSIONS AND REGISTRATIONS

G. Watson Algire—*B.A., University of Maryland, 1930; M.S., 1931.*

DIRECTOR, ALUMNI AFFAIRS

J. Logan Schutz—*B.S., University of Maryland, 1938; M.S., 1940.*

DIRECTOR, ATHLETICS

William W. Cobey—*A.B., University of Maryland, 1930.*

DIRECTOR, FINANCE AND BUSINESS

C. Wilbur Cissel—*B.A., University of Maryland, 1932; M.A., 1934; C.P.A., 1939.*

DIRECTOR, GRADUATE RECORDS

Carl L. Seidel—*B.S., University of Maryland 1963.*

DIRECTOR, PERSONNEL

Bernard J. Williams—*B.A., University of Chicago, 1957; M.A., 1959.*

DIRECTOR, PROCUREMENT AND SUPPLY

Clayton R. Plummer—*B.S., University of New Hampshire, 1936; M.Ed., Springfield College, 1940.*

DIRECTOR, MARYLAND STATE BOARD OF AGRICULTURE PROGRAMS

Charles P. Ellington—*B.S., University of Georgia, 1950; M.S., University of Maryland, 1952; Ph.D., Pennsylvania State University, 1964.*

DIRECTOR AND SUPERVISING ENGINEER, DEPARTMENT OF PHYSICAL PLANT

George O. Weber—*B.S., University of Maryland, 1933.*

ASSOCIATE DIRECTOR AND SUPERVISING ENGINEER, PHYSICAL PLANT (Baltimore)

George W. Morrison—*B.S., University of Maryland, 1927; E.E., 1931.*

REGISTRAR AND ASSOCIATE DIRECTOR OF REGISTRATIONS

James P. Hill—*B.S., Temple University, 1939; Ed.M., 1947; Ed.D., University of Michigan, 1963.*

DIRECTORS OF BUREAUS AND SPECIAL SERVICES

DIRECTOR, BUREAU OF BUSINESS AND ECONOMIC RESEARCH

John W. Dorsey—*B.S., University of Maryland, 1958; Certf., London School of Economics, 1959; M.A., Harvard University, 1962; Ph.D. 1964.*

DIRECTOR, BUREAU OF EDUCATIONAL RESEARCH AND FIELD SERVICES

James D. Rath—*B.S., Yale University, 1954; M.A., 1955; Ph.D., New York University, 1960.*

DIRECTOR, BUREAU OF GOVERNMENTAL RESEARCH

Franklin L. Burdette—*A.B., Marshall College, 1934; M.A., University of Nebraska, 1935; M.A., Princeton University, 1937; Ph.D., 1938; LL.D., Marshall College, 1959.*

DIRECTOR, CENTER OF MATERIALS RESEARCH

Ellis R. Lippincott—*B.A., Earlham College, 1943; M.A., The Johns Hopkins University, 1944; Ph.D., 1947.*

DIRECTOR, FIRE SERVICE EXTENSION

Joseph R. Bachtler—*B.S., University of Southern California, 1956.*

DIRECTOR, LIVESTOCK SANITARY SERVICE

Thomas Alvin Ladson—*V.M.D., University of Pennsylvania, 1939.*

DIRECTOR, MARYLAND TECHNICAL ADVISORY SERVICE

Daniel R. Thompson—*B.A., Queens College, 1950; LL.B., Georgetown University, 1960.*

DIRECTOR, OFFICE OF STUDENT AID

H. Palmer Hopkins—*B.S., Oklahoma State University, 1936; Ed.M., University of Maryland, 1948; Ed.D., George Washington University, 1962.*

DIRECTOR, STUDENT HOUSING

Miss Margaret C. Lloyd—*B.S., University of Georgia, 1932; M.Ed., University of Maryland, 1961.*

DIRECTOR, UNIVERSITY RELATIONS, BALTIMORE CAMPUS

Miss Beth Wilson—*B.A., University of Nebraska, 1930.*

DIRECTOR, WIND TUNNEL

Donald S. Gross—*B.S., University of Maryland, 1947.*

DIRECTOR, HEALTH SERVICES

Lester M. Dyke—*B.S., M.D., University of Iowa, 1926; M.A., Oxon University, 1945.*

DIRECTOR, COUNSELING CENTER

Thomas Magoon—*B.A., Dartmouth College, 1947; M.A., University of Minnesota, 1951; Ph.D. 1954.*

Standing Committees, Faculty Senate

GENERAL COMMITTEE ON EDUCATIONAL POLICY

GENERAL COMMITTEE ON STUDENT LIFE, WELFARE, RIGHTS AND RESPONSIBILITIES

ADJUNCT COMMITTEES: STUDENT ACTIVITIES

FINANCIAL AIDS AND SELF-HELP

STUDENT PUBLICATIONS AND COMMUNICATIONS

RELIGIOUS LIFE

STUDENT HEALTH AND SAFETY

STUDENT DISCIPLINE

ADMISSIONS AND SCHOLASTIC STANDING

INSTRUCTIONAL PROCEDURES

SCHEDULING AND REGISTRATION

PROGRAMS, CURRICULA AND COURSES

FACULTY RESEARCH

PUBLIC FUNCTIONS AND COMMENCEMENTS

LIBRARIES

UNIVERSITY PUBLICATIONS

INTERCOLLEGIATE COMPETITION

PROFESSIONAL ETHICS, ACADEMIC FREEDOM AND TENURE

APPOINTMENTS, PROMOTIONS AND SALARIES

FACULTY LIFE AND WELFARE

MEMBERSHIP AND REPRESENTATION

COUNSELING OF STUDENTS

BALTIMORE CITY CAMPUS AFFAIRS

ADJUNCT COMMITTEE: BALTIMORE CITY CAMPUS STUDENT AFFAIRS

THE FUTURE OF THE UNIVERSITY



ROBERT B. BECKMANN, DEAN

The College

The four-year programs outlined in this catalog lead to the degree of Bachelor of Science with curriculum designation in aerospace engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, or fire protection. The engineering programs integrate these elements: (1) *basic sciences* including mathematics, physics, chemistry; (2) *engineering sciences* including mechanics of solids and fluids, engineering materials, thermodynamics, electricity and magnetism; (3) *professional studies* in aerospace, chemical, civil, electrical or mechanical engineering; (4) *liberal arts and social studies* in the General Education Program; and (5) certain other required subjects including health and physical activities.

GENERAL INFORMATION

Increasingly, the boundary between engineers and applied scientists or applied mathematicians becomes less distinct. The various branches of engineering similarly interact with each other, as technical problems become more sophisticated, and require a combined attack from several disciplines. The engineer occupies an intermediate position between science and the public, because, in addition to understanding the scientific principles of a situation, he is concerned with the timing, economics, and values that define the useful application of those principles.

Each program lays a broad base for *continued learning* after college in professional practice, in business or industry, in public service, or in graduate study and research.

AEROSPACE ENGINEERING

Aerospace engineering involves the application of the laws of physics and mathematics to the problems of flight through the earth's atmosphere and outer space. The main sub-divisions of the field are aerodynamics, structures, propulsion, and design. Many problems, such as those of aeroelasticity and flutter, cut across dividing lines. The aerodynamicist must start out with an understanding of the laws of fluid flow at low speed, then modify these principles for the effects of higher speeds. At supersonic speeds, he must account for shock waves in flight at moderate altitudes and further changes in the flow at extremely high altitudes. At extremely high speeds he must add to this an understanding of the effects of ionization and molecular dissociation. The structures engineer is mainly concerned with the ability of the vehicle to withstand the forces and accelerations in flight. For high performance aircraft and missiles, he must consider the aerodynamic heating resulting from high-speed

flight and allow for the weakening effect on materials. The propulsion engineer must deal with rocket, jet, or propellor systems which serve to accelerate the vehicle and to offset drag forces during flight. The design engineer must apply the principles of aerodynamics, structures, and propulsion with ingenuity to determine the optimum aerospace vehicle for the specified mission. A cardinal principle is that the overall efficiency of the vehicle, rather than that of its individual components, is the ultimate goal of good design. The aerospace engineer is continually beset with the problems of maintaining adequate margins of safety with a minimum of weight. The saving of even one pound of weight in fuel or structure of a missile is of such value as to justify the expenditure of many man-hours. These high dividends for thoroughness and precision in technical understanding are a source of gratification to the aerospace engineer.

CHEMICAL ENGINEERING

Chemical engineering involves the application of sound engineering and economic principles—and basic sciences of mathematics, physics, and chemistry—to process industries concerned with the chemical transformation of matter. The chemical engineer is primarily concerned with research and process development leading to new chemical process ventures or a better understanding of existing ones; with the efficient operation of the complete chemical plant or its component units; with the technical service engineering required for improving and understanding chemical plant operation and the products produced; with the chemical sales and economic distribution of the chemical plant product; and with the general management and executive direction of chemical process industry plants and industrial complexes.

Because of this wide range of ultimate application, the chemical engineer finds interesting and diverse career opportunities in such varied fields as chemical (inorganic and organic), food processing and manufacture, metallurgical, nuclear and energy conversion, petroleum (refining, production, or petrochemical), and pharmaceutical industries. Additional opportunities are presented by the research and development activities of many public and private research institutes and allied agencies.

The chemical engineering department offers a curriculum to prepare the undergraduate for a challenging career in any of the aforementioned fields of interest—a curriculum that will prepare him for continued graduate study or immediate industrial employment following the baccalaureate degree.

CIVIL ENGINEERING

Civil engineering is perhaps the largest and most diversified profession today. Civil engineering includes such areas of specialization as construction planning and management; digital computer applications to design and analysis of engineering structures, transportation networks, and water resource systems; environmental health; hydraulics and hydrology; materials; soil mechanics.

Professional civil engineers plan, design, and supervise construction of virtually every large enterprise involving construction, transportation, industrial facilities, and public works. Having planned and supervised construction of a major project, civil engineers are often selected to direct its operation as managers or executives.

Civil engineers design structures such as bridges, buildings, dams, power plants, tunnels . . . They plan and direct the use of water for cities, industries, flood control, irrigation, and power. Civil engineers trained in environmental health must have the ability to utilize basic information from the life sciences in solving the complex environmental engineering problems that man has created in the twentieth century. This requires highly imaginative and energetic people who can move into new frontier areas in water and air pollution control, water chemistry and biology, water and air resources, life-sciences, and solid waste handling.

ELECTRICAL ENGINEERING

Electrical engineering education is a good preparation for any of several careers—in research, development, design, production, sales, technical management, or teaching—within the broad area of the useful application of electrical and electronic phenomena. An increasing number of electrical engineering graduates have in recent years specialized in such fields as electronic computers, cybernetics and system engineering, automatic control, telemetry and space navigation, communications, radar, and solid state device technology. A smaller number of graduates with particular interests and abilities have been attracted to such pioneering areas as biomedical electronics, electromechanical transducer design, design of particle accelerators, and other machines and instrumentation for use in research in physics, microminiaturization of electronic component assemblies, or antenna design. The traditional fields of electric power generation and transmission, radio, and television continue to offer satisfying careers to the electrical engineering graduate.

Increasingly, the boundary between electrical engineers and applied physicists or applied mathematicians becomes less distinct, particularly at the research level. The various branches of engineering similarly interact with each other, as technical problems become more sophisticated, and require a combined attack from several disciplines. The engineer occupies an intermediate position between science and the public, because, in addition to understanding the scientific principles of a situation, he is concerned with the timing, economics, and values that define the useful application of those principles.

In many cases, engineers have as a major duty the supervision of other engineers, and of technicians. Hence electrical engineering involves not only scientific knowledge but also the ability and judgment to work effectively and communicate easily with many other people. Clearly, the desirable attributes for success vary from one career choice to another within electrical engineering. The specialist in creative research and advanced development needs graduate work to the M.S. or Ph.D. degree. An engineering sales representative, however, would in most cases begin to acquire the needed detailed awareness of current practice by taking a job immediately after the B.S. degree.

In this context of electrical engineering as a broad and diverse field the goal of the Department is to provide an educational program and environment of challenge, so that the graduate will be well prepared to enter any of the areas of electrical engineering for which he is suited. To this end, the B.S. program makes provision for several technical electives, and the M.S. and Ph.D. graduate programs foster specialization through intensive research.

MECHANICAL ENGINEERING

The principal function of the mechanical engineer is to apply science and technology creatively to the design and manufacture of machines for the practical use of mankind. Any machine or manufactured product requires, basically, (1) the art and science of generating, transmitting, and utilizing mechanical power, and (2) research, development, designing, and the coordination of materials, personnel, and management. These basic requirements define mechanical engineering. The following *professional divisions* of the American Society of Mechanical Engineers give a good idea of types of work in which the mechanical engineer may become associated: applied mechanics, aviation, bio-engineering, materials handling, management, oil and gas power, fuels, safety, hydraulics, metals engineering, heat transfer, process industries, production, machine design, lubrication, petroleum, nuclear engineering, railroads, power, textile, gas turbine power, wood industries, rubber and plastics, and instruments and regulators.

Because of the wide variety of engineering opportunities available to the mechanical engineer, the curriculum is designed to give the student a thorough training in the basic sciences: physics, chemistry, mathematics, solid and fluid mechanics, dynamics, thermodynamics, heat transfer, materials, electricity, nuclear technology, power, and design.

There are opportunities for mechanical engineers in all manufacturing enterprises. There are opportunities in research, design, production, testing, maintenance, and sales. There are opportunities for engineers who can devise manufactured products that utilize power in any form for the convenience of man. There are opportunities wherever there are factories. Since every town of moderate size has factories, the mechanical engineer may select the community where he wishes to make his home and be reasonably certain that he can find satisfactory employment there.

AGRICULTURAL ENGINEERING

A complete description of the program in Agricultural Engineering may be found in the College of Agriculture catalog. The program is a four-year academic curriculum leading to the degree of Bachelor of Science. Students majoring in Agricultural Engineering may register in either the College of Agriculture or the College of Engineering.

FIRE PROTECTION ENGINEERING

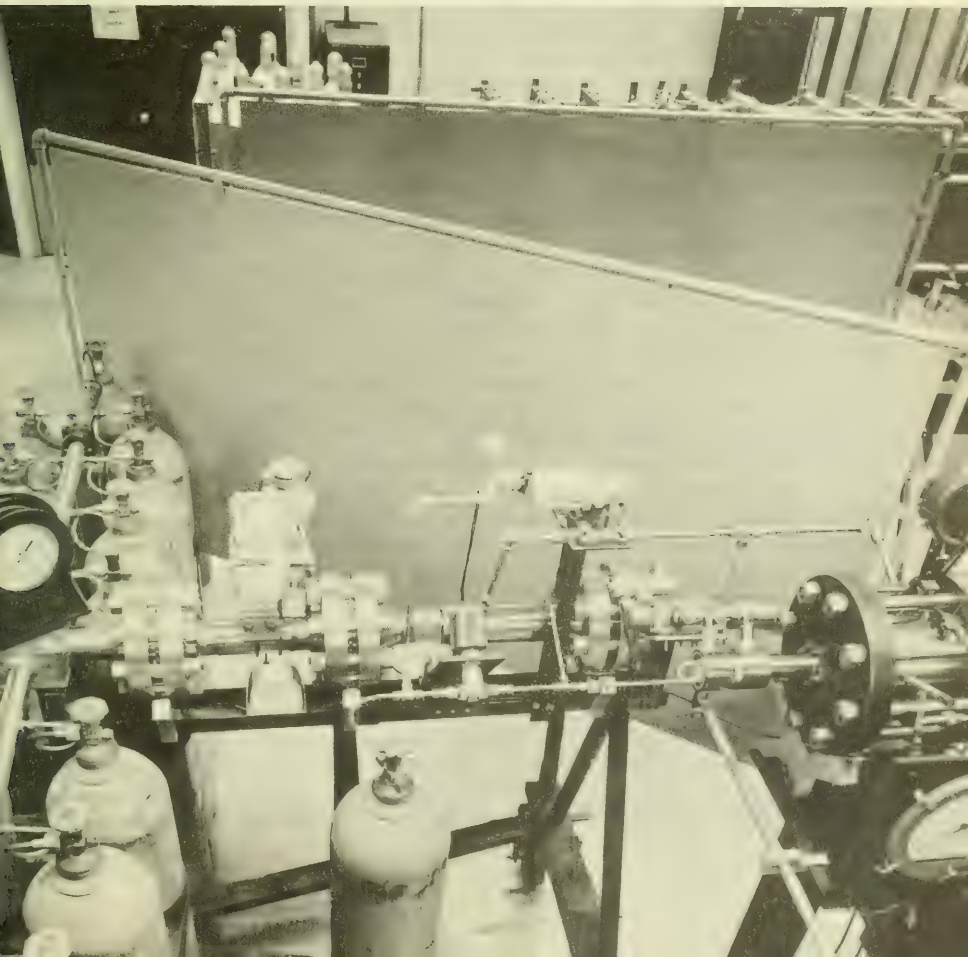
Fire protection is concerned with the scientific and technical problems of preventing loss of life and property from fire, explosion and related hazards, and of evaluating and eliminating hazardous conditions.

The fundamental principles of fire protection are relatively well defined and the application of these principles to a modern industrialized society has become a specialized activity. Control of the hazards in manufacturing processes calls for an understanding not only of measures for fire protection but of the processes themselves. Often the most effective solution to the problem of safeguarding a hazardous operation lies in the modification of the process rather than in the installation of special extinguishing equipment. The expert in fire

protection must be prepared to decide in any given case what is the best and most economical solution of the fire prevention problem. His recommendations are often based not only on sound principles of fire protection, but on a thorough understanding of the special problems of the individual property.

Modern fire protection utilizes a wide variety of mechanical and electrical equipment which the student must understand in principle before he can apply them to special problems. The fire protection curriculum emphasizes the scientific, technical and humanitarian aspects of fire protection, and the development of the individual student.

The problems and challenges which confront the specialist in fire protection include the reduction and control of fire hazards due to processes subject to fire or explosion in respect to design, installation and handling, involving both physical and human factors; the use of buildings and transportation facilities to restrict the spread of fire and to facilitate the escape of occupants in case of fire; the design, installation and maintenance of fire detection and extinguishing devices and systems; and the organization and education of persons for fire prevention and fire protection.



Cognate Activities

Departments in The College of Engineering which contribute significantly to activities in education, research, and professional service—although they have no academic curricula—include the Institute of Fluid Dynamics and Applied Mathematics; the Department of Wind Tunnel Operations; and the Fire Service Extension Department. These Departments work closely with academic departments of the University in areas of common interest. The scope of work in each department area is outlined briefly in paragraphs which follow.

Fellowship grants and contracts for fundamental research contribute to the overall professional-scientific activity of the staff of the College. The staff of the College of Engineering available for research studies will be glad to discuss proposed problems of importance to industry and of public interest where means can be found for the cooperative researches; such studies may be undertaken with the approval of the administration of the University.

Institute for Fluid Dynamics and Applied Mathematics

Investigations in applied mathematics traditionally have centered on partial differential equations of mathematical physics, specifically initial value, boundary value and eigenvalue problems and their numerical treatment. More recently, attention has been drawn to current questions in ordinary differential equations such as hereditary dependence and control theory, and to mathematical methods in statistical mechanics and theoretical biology. Theoretical studies of gas dynamics and plasma dynamics are carried out in conjunction with laboratory experiments employing facilities such as a spectroscopic shock tube and a thermal plasma device (Q-machine). Applications to astrophysics, e.g., the elemental abundance problem, to nonlinear mechanics and to space physics engage the attention of the staff. Institute physicists are experimenters and co-experimenters in a number of space flights involving balloons, rockets or interplanetary satellites. Research in meteorology as an extension of fluid dynamics to planetary atmospheres encompasses both theoretical and experimental techniques. The Institutes research program is partially supported by outside contracts and grants.

Staff members are available for thesis direction of graduate students pursuing advanced degrees in various departments of the University. Approximately 100 master's and Ph.D. degrees were earned during the period 1951-65 in the departments of Mathematics, Physics and Astronomy, Mechanical Engineering and Aerospace Engineering with theses under the direction of Institute faculty. In addition, staff members teach an increasing number of graduate and undergraduate courses in other departments of the University. Fellowships and research graduate assistantships are available to support the studies of qualified

graduate students, and the Institute offers its facilities and financial support both to post-doctoral fellows and senior scholars on leave from other institutions.

Institute staff members work closely with faculty and staff of other University departments on problems of mutual interest, and with scientists at many governmental and educational institutions in the Washington-Baltimore area.

Wind Tunnel Operations

The Wind Tunnel Operations Department conducts a program of experimental research and development in cooperation with the aircraft industry, agencies of government, and other industries with problems concerning aerodynamics. Testing programs cover a variety of subjects including all types of aircraft, missiles, ordnance, parachutes, radar antennas, trucks, automobiles, structures, and exterior equipment subject to high winds.

The Department has a 7.75x11-foot wind tunnel that can be operated at speeds from 0 to 240 mph. This facility has powered model drive equipment, and auxiliary vacuum and high pressure air supplies for boundary layer control studies. Supporting shops include complete woodworking, machine shop, photographic, and instrumentation facilities.

The full time staff of the Department includes engineering, computing, shop, and technical operations personnel. This staff cooperates with other faculty and students in the College of Engineering on special problems of mutual interest.

Fire Service Extension Department

The Fire Service Extension Department provides in-service training for volunteer, municipal, and industrial firemen and serves in an advisory capacity in matters of fire prevention, fire protection, and fire safety regulations. Classes are conducted in Maryland by local instructors who work under the guidance of Senior Instructors of the Department. Basic training is given in the fundamentals of firemanship. An advanced course covers the technical field of fire prevention, control and extinguishment. Specialized courses are offered for fire officers in tactics and strategy of fire suppression and in fire department administration. A training course of 42 clock hours for rescue operations is also available. An increasingly important program is that of establishing and improving fire prevention and fire protection in Maryland industry, institutions and merchantile establishments.

A four-day short course is held annually in September at the University. Specialized courses include instructor training, pump school series, hydraulics, aerial ladders.

Additional information may be obtained from the Director, Fire Service Extension Department, University of Maryland, College Park, Maryland 20742.

Other Research Laboratories

The National Sand and Gravel Association and the National Ready Mixed Concrete Association have research laboratories on the campus. These agencies also sponsor fellowships for graduate students who will devote half-time to graduate study and half-time to research on approved projects in their respective

areas of interest. Fellows will be selected from applicants who have been admitted to graduate study in some field of engineering. Applications for admission to graduate study should be made on forms that may be obtained from the Dean of the Graduate School, University of Maryland, College Park, Maryland 20742.



Academic Information

Admission Requirements

Young men and women who wish to take an engineering program in college should enroll in an *academic* program in high school. A good academic record in high school is a basic requirement. Subjects that are recommended for admission are these:

SUBJECTS	RECOMMENDED
English	4 units
Mathematics (college preparatory)—including algebra, plane geometry, and trigonometry, or other advanced mathematics	4 units
History and social sciences	2 units
Physical sciences	2 units
Foreign language (German, French or Russian preferred)	2 units
Unspecified academic subjects or suitable electives	2 units
Total	16 units

A complete statement of admission requirements and policies will be found in *An Adventure in Learning*. Application for admission should be made to the Director of Admissions, University of Maryland, College Park, Maryland 20742.

Application Information

FALL SEMESTER: All applications for full-time undergraduate admission for the Fall Semester at the College Park campus must be received by the University on or before June 1. Any student registering for nine (9) or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. This means that the applicant's education records (except current summer school grades), SAT scores (in the case of new freshmen) and medical examination report must be received by July 15.

SPRING SEMESTER: The deadline for the receipt of applications for the Spring Semester is January 1.

GRADUATE SCHOOL: Application for admission to the Graduate School must be made by July 15 for the fall term and by December 15 for the spring term on

blanks obtained from the Office of the Graduate School. Admission to the summer session is governed by the date listed in the Summer School catalog. The summer session deadline is May 15.

Adventure in Learning

All freshmen in the College of Engineering enroll in essentially the same subjects as detailed in this catalog.

Each student will select his major-line department before he begins his sophomore year's work. Thereafter he will pursue the approved program of his department which leads to the bachelor's degree.

Advanced students who show promise of creativity and leadership in engineering, in the engineering sciences, and in teaching and research, are encouraged to continue in a program of graduate study leading to master's and doctor's degrees. Able men and women *with ability* will find challenging opportunities if they have such top-level preparation. The best time to plan and to begin preparing for these top-level opportunities is while one is in high school. Parents and teachers can help by leading, by pointing ways, and by maintaining proper standards of performance and conduct. But the lifelong *adventure in learning*, which is the true characteristic of the well-educated man or woman, demands systematic mental exercise throughout life. "Chance favors the prepared mind!"

Expenses

Annual expenses of attending the University are approximately as follows: \$390.00 fixed charges, \$116.00 special fees, \$540.00 (Full Contract) board; \$360.00 lodging for Maryland residents, or \$460.00 for residents of other states and counties. A matriculation fee of \$10.00 is charged all new students and is payable only once. A fee of \$10.00 must accompany a prospective student's application for admission. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. A charge of \$500.00 (\$250.00 a semester) is assessed to all students who are non-residents of the State of Maryland. Students who are minors are considered to be resident students if at the time of their registration their parents have been domiciled in the State of Maryland for at least six months.

The status of the residence of a student is determined at the time of his first registration in the University and may not thereafter be changed by him unless, in the case of a minor, his parents move to and become legal residents of Maryland by maintaining such residence for at least six months. However, the right of the minor student to change from a non-resident status to resident status must be established by him prior to the registration period set for any semester.

Adult students are considered to be residents if at the time of their registration they have been domiciled in Maryland for at least six months provided such residence has not been acquired while attending any school or college in Maryland or elsewhere. Time spent on active duty in the armed services while stationed in Maryland will not be considered as satisfying the six-months period referred to above except in those cases in which the adult was domiciled in Maryland for at least six months prior to his entrance into the armed service and was not enrolled in any school during that period.

The word "domicile" as used in this regulation shall mean the permanent place of abode. For the purpose of this rule only one domicile may be maintained.

An Adventure in Learning, a bulletin which serves as a guide to the undergraduate programs of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park 20742.

Air Science Instruction

The University of Maryland operates one of the largest Air Force Reserve Officer Training Units in the United States. ROTC is offered on a completely elective basis. Its curriculum is generalized, consisting of courses designed to produce citizens and officers with well-rounded backgrounds.

The University offers incoming students a choice of a two-year or a four-year program. Successful completion of either program qualifies the student for a commission in the Air Force upon graduation. For further details concerning Air Science, refer to *An Adventure in Learning* bulletin.

Libraries

The libraries of the University are located on both the College Park and Baltimore campuses. They include the Theodore R. McKeldin Library and the many college and departmental libraries which house special collections. Because of the location of the University the large libraries of Baltimore and Washington are a valuable asset to graduate work. Arrangements can be made for personal work in the Enoch Pratt Library of Baltimore, the Library of Congress, the United States Department of Agriculture Library and the many fine collections of other government agencies in Washington.

Located in a geographical area rich in library resources, the University's libraries are well equipped to serve the engineering programs of study and research. The Engineering and Physical Sciences Library which supplements the Science and Technology Division of the general University Library is in the north wing of the Mathematics Building adjacent to the main Engineering building. The building was extended in 1968 which allowed the Library to more than double its area and increase its book stack capacity to 200,000 volumes. Stacks are open to all students. The Library's first floor contains the administrative offices, reference and loan departments, a reading room and a smoking lounge. A second reading room, restricted to faculty and graduate students, is located on the third floor. The Technical Reports Center and microform equipment are also on this floor. Microfilm and micro-card readers and complete photocopying service are available.

The Library collection covers the fields of engineering, mathematics, chemistry, physics and industrial education. Its journal holdings represent over a thousand titles in science and technology; more than nine hundred are currently received. Several personal libraries of outstanding scientists and engineers have been acquired by the Library, the most extensive being the private collections of Max Born and Richard Von Mises. The Library is a designated depository of U.S. Atomic Energy Commission unclassified reports, including

those of atomic energy establishments of Great Britain, Canada and other nations. Inter-library loan agreements assure the receipt of special materials from other libraries throughout the country.

General Facilities

The College of Engineering, and departments in other colleges of the University, are well equipped for instruction and basic research in the respective areas of activity. There is excellent interdepartmental cooperation in furthering studies of mutual interest.

Scholarships and Grants-in-Aid

Scholarships and grants-in-aid are awarded each year to selected students in the College of Engineering. A list of such awards is published in the University publication *An Adventure in Learning*. Applications should be filed on forms which may be obtained from the Director, Office of Scholarships and Grants-in-Aid, University of Maryland, College Park, Maryland.

Honors and Awards

The College of Engineering schedules annually in the Spring an *Honors Day Convocation* to direct public attention to students and faculty who have distinguished themselves by scholarship and worthy activities. Families and friends of honorees, sponsors of scholarships and awards, alumni, and others interested in the University are cordially invited to this convocation.

Professional and Honor Societies

Student branches of the following national engineering societies are established in the College of Engineering: American Institute of Aeronautics and Astronautics, American Institute of Chemical Engineers, American Society of Civil Engineers, Institute of Electrical and Electronics Engineers, American Society of Mechanical Engineers, the National Society of Fire Protection Engineers, and the Society of Women Engineers.

Each student is urged to be active in his engineering society. At meetings of professional societies he will meet distinguished engineers representing science, industry, practice, and public service. In discussions of scientific and engineering subjects he can learn to think for himself and to speak effectively. In teams and committees he can learn to work effectively with others. Indeed, it pays a student to be active in his student branch as it pays a graduate engineer to be active in his national engineering society.

Engineering students are encouraged to attend meetings of local sections of their professional and scientific societies in nearby Baltimore and Washington, to get acquainted with other men in their fields, and to visit nearby industries, public works, libraries and laboratories.

The following national honorary societies of particular interest to students in engineering and related sciences have active chapters at the University of Maryland: Tau Beta Pi, general engineering; Sigma Xi, scientific research; Phi Kappa Phi, senior scholarship; Sigma Gamma Tau, aerospace engineering; Eta Kappa Nu, electrical engineering; Salamander, fire protection; Pi Tau Sigma, mechanical engineering; Chi Epsilon, civil engineering;

Graduate Study

An applicant for admission to the Graduate School must hold a bachelor's or a master's degree from a college or university of recognized standing. The applicant shall furnish an official transcript of his collegiate record which for unconditional admission must show credible completion of an adequate amount of high quality for graduate work in his chosen field.

Application for admission to the Graduate School should be made not later than July 15 for the fall term and December 15 for the spring term on blanks obtained from the office of the Dean of the Graduate School, University of Maryland, College Park, Maryland 20742. Information on graduate work is published in the Graduate School Announcements.

Graduate Assistantships and Research Assistantships with stipends for service, and Fellowships, are available for study and research in the several departments of the College of Engineering. Only full-time students who have been admitted to the Graduate School are eligible for appointment. Preference is given to graduate students who are American citizens in view of limitations of available funds. Foreign students may be considered for vacancies after they have completed at least one year of full-time graduate study in residence at the University of Maryland. Letters of application for assistantships or fellowships should be directed to the head of the student's major department in the College of Engineering.

For Additional Information

A detailed explanation of the regulations of student and academic life may be found in the University publication entitled *University General and Academic Regulations*.

Required Courses

STRUCTURE OF ENGINEERING CURRICULA

COURSES IN THE NORMAL CURRICULUM OR PROGRAM AND PRESCRIBED credit hours leading to the degree Bachelor of Science (with curriculum designation) are outlined on the following pages for each department in the College of Engineering. “. . . No student may modify the prescribed number of hours without special permission from the dean of his college.” The courses in each curriculum may be classified in the following categories:

1. Certain courses required of all undergraduate students in the University. Students who are not specifically exempted are required to register in and successfully complete two prescribed courses in physical education for a total of two semester hours of credit. A health course (2 credits) is also required of all undergraduate men and women.
2. Courses in the General Education Program. These include: English (9 credits), Fine Arts or Philosophy (3 credits), History (6 credits), and Social Science (6 credits). A listing of specific courses which meet the requirements of the General Education Program are listed below.
3. Courses in the physical sciences—Mathematics, Chemistry, Physics.
4. Collateral engineering courses—engineering sciences, and other courses approved for one curriculum but offered by another department.
5. Courses in the major department.

A student should obtain written approval for any substitution of courses from the department head and the dean of his college.

The courses in each engineering curriculum, as classified above, form a sequential and development pattern in subject matter. In this respect, curricula in engineering may differ from curricula in other colleges. Some regulations which are generally applicable to all students (see *University General and Academic Regulations*) may need clarification for purposes of orderly administration among engineering students. Moreover, the College of Engineering establishes policies which supplement the University Regulations.

SUPPLEMENTAL NOTES

1. The responsibility for proper registration and for satisfying stated prerequisites for any course must rest with the student—as does the responsibility for proper achievement in courses in which he is enrolled. Each student should be familiar with the provisions of this catalog, *University General and Academic Regulations*, and other pertinent regulations.
2. A student who is enrolled for more than 8 semester-hours of work must register for physical education each semester until he has fully satisfied the University's requirement. He should schedule the required two credits of Health during his first thirty credits of registration in the University.

3. Required courses in mathematics, physics, and chemistry have highest priority; and every engineering student must register for mathematics and chemistry—or mathematics and physics—until he has fully satisfied requirements of the College of Engineering in these subjects. Courses in mathematics, chemistry and physics may not be dropped.
4. A student is advised to schedule a reduced load if his record of scholarship during the previous semester was unsatisfactory (a) because he failed courses, or (b) because his average during the previous semester was less than 2.0 ("C"). A student who is on probation may not schedule more than 16 semester-hours of work in any semester, *including* credit for physical education and military science. However, he may not defer the top-priority subjects noted in Paragraphs 2 and 3 above without written approval of the Dean.
5. A student in the College of Engineering has attained junior standing when he has completed a minimum of 56 academic hours toward his degree, including 15 credits of mathematics and 11 credits of physics and possessing the minimum required grade point average to remain in the University.
6. As indicated in *University General and Academic Regulations* a student who has not attained Junior Standing may not register for upper division courses.
7. To be eligible for a bachelor's degree in the College of Engineering, a student must have an *average* of at least "C"=2.0—(a) in all subjects applicable to his degree, and (b) in all junior-senior courses in his major department. Responsibility for knowing and meeting all degree requirements for graduation in any curriculum rests with the student.

GENERAL EDUCATION REQUIREMENTS

In order that each graduate with a bachelor's degree may gain a liberal education as well as a specialized one, the University has established a General Education Requirement. This requirement consists of 34 credits in six general fields. Students in the College of Engineering automatically satisfy the ten credits required in Mathematics and Science fields through required courses in the Engineering curricula. General Education requirements in the other four fields are as follows:

- (1) English (9 hours): ENGL 001—Composition or ENGL 021—Honors Composition; ENGL 003 and 004—World Literature
- (2) Fine Arts or Philosophy (3 hours), three-credit courses in five departments are available, as follows: ART COURSES: 010—Introduction to Art; 060 or 061—History of Art; 065 or 066—Masterpieces of Painting; 067 or 068—Masterpieces of Sculpture; 070 or 071—Masterpieces of Architecture; 080 or 081—History of American Art. DANCE COURSES: 032—Introduction to Dance; 182 or 183—History of Dance; 184—Theory and Philosophy of Dance. MUSIC COURSE: 020—Survey of Music Literature. SPEECH COURSES: 016—Introduction to the Theatre; 114—The Film as an Art Form. PHILOSOPHY COURSES: 001—Introduction to Philosophy; 041—Elementary Logic and Semantics; 045—Ethics; 052—Philosophy in Literature; 053—Philosophy of Religion; 056—Philosophy of Science; 147—Philosophy of Art; 152—Philosophy of History; 154—Political and Social Philosophy.
- (3) History (6 hours); the student is required to distribute his work between United States and non-United States fields, with three hours in each. Rec-

ommended courses in United States History are: 021—History of the United States to 1865; 022—History of the United States since 1865; 023—Social and Cultural History of Early America; 024—Social and Cultural History of Modern America; or 029—The United States in World Affairs. For the exceptionally well-prepared student, however, 100-level (junior or senior) courses which have no prerequisite are also available. In non-United States History, recommended courses are: 031 or 032—Latin American History; 041 or 042—Western Civilization; 051 or 052—The Humanities; 053 or 054—History of England and Great Britain; 061 or 062—Far Eastern Civilization; or 071 or 072—Islamic Civilization. Here also the well-prepared student may use non-prerequisite courses at the 100-level to satisfy the requirement.

- (4) Social Science (6 hours), two courses may be chosen from five fields: Anthropology 001—Introduction to Anthropology Economics 031—Principles of Economics, or Economics, 037—Fundamentals of Economics; Geography 001—Introduction to Geography; Government and Politics 001—American Government, or Government and Politics 003—Principles of Government and Politics, or Government and Politics 101—International Relations; Psychology 001—Introduction to Psychology; or Sociology 001—Introduction to Sociology.

Course Offerings

THE UNIVERSITY RESERVES THE RIGHT TO CHANGE ANY PROVISIONS OR requirements at any time within the student's term of residence; or to withdraw or discontinue any course; or to ask a student to withdraw when it considers such action to be in the best interests of the University. If a scheduled course is withdrawn or discontinued, the fee for change in registration will not be charged.

Courses designated by numbers 001 to 099 are for undergraduates; above 200 for graduate students; and from 100 to 199 for advanced undergraduates and (subject to official approval) for graduates also.

A separate schedule of courses is issued each semester showing the hours, places of meeting, and other information required by the student in making out his program. These schedules for a particular semester are available during its period of registration.

The responsibility for proper registration and for satisfying stated prerequisites for any course must rest with the student—as does the responsibility for proper achievement in courses in which he is enrolled. Each student should be familiar with the provisions of this catalog, *University General and Academic Regulations*, and other pertinent regulations.

BASIC AND ALTERNATE CURRICULA FOR FRESHMEN IN ENGINEERING

Students who are prepared to scheduled MATH 019 (as indicated by results of the University's clarification test) schedule the following Basic Curriculum for Freshmen:

FRESHMAN YEAR (Basic)	Semester	
	I	II
MATH 019—Analysis I	4	..
MATH 020—Analysis II .....	..	4
CHEM 001, 003—General Chemistry	4	4
ENES 001—Intro. Engineering Science	3	..
ENES 010—Mechanics .....	..	3
PHYS 030—General Physics .....	..	3
General Education Courses	3	3
HLTH 005—Science and Theory Health	(2)	..
Physical Education	1	1
Total	15 or (17)	18

Students who are not prepared to schedule MATH 019 (as indicated by results of the University's classification test) are advised to schedule MATH 018 and ENG 001 in the Summer Session before the fall (first) semester. Otherwise they will schedule courses in the Alternate Curriculum for Freshmen in the following sequence:

FRESHMAN YEAR PLUS SUMMER (Alternate)	Semester—Summer—		
	I	II	III
MATH 018—Intro. Analysis*	3	..	..
MATH 019—Analysis I	..	4	..
MATH 020—Analysis II	..	..	4
CHEM 001, 003—General Courses	4	4	..
General Education Courses	6	3	..
ENES 001—Intro. Engr. Science	3	..	..
ENES 010—Mechanics	..	3	..
PHYS 030—General Physics	..	..	3
HLTH 005—Science and Theory of Health	..	2	..
Physical Education	1	1	..
Total	17	17	7

MATH 018 is an additional course for students who do not qualify to register for MATH 019.

AEROSPACE ENGINEERING

Professors: CORNING, PAI*, RIVELLO, SHERWOOD, AND THOMAS.

Associate Professors: MELNIK AND SCHETZ.

Assistant Professors: DONALDSON AND PLOTKIN.

Instructor: ORTH.

Lecturers: BILLIG, BRANDT, RUSH, AND WILSON.

AEROSPACE ENGINEERING CURRICULUM

SOPHOMORE YEAR	Semester—	
	I	II
MATH 021, 066—Analysis III, Differential Equations	4	3
PHYS 031, 032—General Physics	4	4
ENES 020—Mechanics of Materials	3	..
ENES 021—Dynamics	..	3
ENME 001—Thermodynamics I	..	3
CMSC 020—Elementary Algorithmic Methods	3	..
General Education Courses	3	3
Total	17	16

JUNIOR YEAR		
General Education Courses	3	3
ENAE 101—Aerodynamics I	3	..
ENAE 102—Aerodynamics II	..	3
Technical Elective	..	3
ENAE 113—Flight Structures	..	3
ENES 030—Materials Science	3	..
ENME 106—Transfer Processes	..	3
MATH 022—Analysis IV	4	..

*Institute for Fluid Dynamics and Applied Mathematics

	Semester	
	I	II
JUNIOR YEAR (Continued)		
ENEE 060, 062—Principles of Electrical Engineering	3	3
ENEE 061, 063—Electrical Engr. Lab.	1	1
Total	17	19
SENIOR YEAR		
General Education Courses	3	3
ENAE 107, 108—Aerospace Design	4	4
ENAE 109, 110—Flight Propulsion	3	3
ENAE 111, 112—Elective Research	2	2
ENAE 114—Flight Structures	4	..
ENAE 115—Aerodynamics III	3	..
ENAE 117—Aircraft Vibrations .....	..	3
ENAE 118—Dynamics of Aerospace Vehicles .....	..	3
Total	19	18

For Advanced Undergraduates and Graduates

ENAE 101. AERODYNAMICS I. (3)

First semester. Three lectures a week. Prerequisite, PHYS 032 and MATH 066. Basic fluid mechanics and aerodynamic theory.

(Melnik, Plotkin, Sherwood)

ENAE 102. AERODYNAMICS II. (3)

Second semester. Three lectures a week. Prerequisite, ENAE 101. Elements of compressible flow and application to engineering problems.

(Plotkin, Sherwood)

ENAE 107, 108. DESIGN OF AEROSPACE VEHICLES. (4, 4)

First and second semesters, two lectures and two lecture calculation periods a week. Prerequisites, ENAE 101, 102 and 113; first semester, theory background and methods of airplane design, subsonic, supersonic and VTOL; second semester, theory background and methods of space vehicle design, manned orbiting vehicles, manned Lunar and Martian landing systems.

(Corning)

ENAE 109, 110. FLIGHT PROPULSION. (3, 3)

Two lectures and one laboratory period a week. Prerequisites, ENME 001 and concurrent registration in ENAE 102. Operating principles of air breathing and rocket engines. Thermodynamic processes and engine performance, aerothermochemistry of combustion, fuels and propellants, energy for space flight.

(Melnik and Orth)

ENAE 111, 112. ELECTIVE RESEARCH. (2, 2)

One lecture and one laboratory period a week. Prerequisites, ENAE 102 and ENAE 113. Wind tunnel tests; structural tests. Written and oral reports on original research projects.

(Staff)

ENAE 113, 114. FLIGHT STRUCTURES. (3, 4)

First semester, three lectures and one calculation period a week; second semester, three lectures and one calculation period a week. Prerequisites, ENES 020 and MATH 066. Principles and problems of stress analysis and structural design of flight structures.

(Rivello)

ENAE 115. AERODYNAMICS III. (3)

Prerequisite, ENAE 102. Elementary theory of the flow of an incompressible fluid. (Sherwood)

ENAE 117. AIRCRAFT VIBRATIONS. (3)

Three lectures a week. Prerequisite, MATH 066. Vibration and other dynamic problems occurring in structures. Specific topics of study include the free and forced vibration of: single degree of freedom system, multiple degrees of freedom, beams and bars. (Donaldson)

ENAE 118. DYNAMICS OF AEROSPACE VEHICLES. (3)

Second semester. Prerequisites, ENAE 101, 102, 115. Stability, control, loads and miscellaneous topics in dynamics. (Corning)

*For Graduates***ENAE 220, 221. AERODYNAMICS OF INCOMPRESSIBLE FLUIDS. (3, 3)**

Prerequisites, ENAE 115. MATH 113 or 163. Fundamental equations and concepts of fluid mechanics. Irrational motion. Circulation theory of lift. Thin airfoil theory. Lifting line theory. Perturbation methods. (Schetz)

ENAE 224, 225. AERODYNAMICS OF COMPRESSIBLE FLUIDS. (3, 3)

Prerequisite, ENAE 115. One dimensional flow of a perfect compressible fluid. Shock waves. Two-dimensional linearized theory of compressible flow. Two-dimensional isotropic flow. Linearized theory of three-dimensional potential flow. Exact solution of axially symmetrical potential flow. One-dimensional viscous compressible flow. Laminar boundary layer of compressible fluids. (Pai and Melnik)

ENAE 230, 231. THE AERODYNAMICS OF HIGH ALTITUDE VEHICLES. (3, 3)

Prerequisite, permission of instructor. Aerothermodynamic study of several types of high altitude, hypersonic vehicles including ballistic, boost-glide and satellite vehicles. Examination of problems in stability, control, boundary layer growth, shockwave interactions and convective and radiative heating. (Wilson)

ENAE 232, 233. WAVE PROPAGATION IN GASES AND SOLIDS. (3, 3)

Prerequisite, permission of instructor. Application of method of characteristics to unsteady compressible flow. Study of isentropic and non-isentropic flows of both ideal and non-ideal gases. The Lagrange ballistic problem, detonation, the shock tube and spherical waves. Impact loading on elastic-plastic materials, the stopping shock, interactions and reflections in solids. Stress and strain produced in solids with varying cross-sectional area. (Seigel)

ENAE 234, 235. AEROSPACE FACILITIES AND TECHNIQUES. (3, 3)

Prerequisite, permission of instructor. Problems in supersonic and hypersonic tunnel development such as the aerodynamic design of nozzles, diffusers, storage systems and arc heaters. Shock tubes and shock tube wind tunnels. Development of ballistic ranges and basic considerations in the design of high-speed launchers. Instrumentation and data reduction.

ENAE 236, 237. HEAT TRANSFER PROBLEMS ASSOCIATED WITH HIGH VELOCITY FLIGHT. (3, 3)

Prerequisite, permission of instructor. Heat conduction in solids and thermal radiation of solids and gases. Analytic solutions to simple problems and numerical methods for solving complicated problems. Convective heating associated with laminar and turbulent boundary-layer flow. Heat transfer equations for

selected body shapes such as cones and hemispheres. Real gas effects on convective heating. (Wilson)

ENAE 250, 251. ADVANCED FLIGHT STRUCTURES. (3, 3)

Prerequisites, MATH 066 and ENAE 113, 114, or permission of the instructor. Advanced topics in structural theory with applications to flight vehicle structures. Energy and matrix methods; plate theory; instability and failure of columns, plates, and stiffened panels; and introduction to shell theory.

(Rivello)

ENAE 260, 261. ADVANCED PROPULSION. (3, 3)

Prerequisites, ENAE 109, 110. Special problems of thermodynamics and dynamics of aircraft power plants; jet, rocket and ramjet engines; plasma, ion and nuclear propulsion for space vehicles.

(Billig)

ENAE 270, 271. STRUCTURAL DYNAMICS AND AEROELASTICITY. (3, 3)

Prerequisites, MATH 066 and ENAE 114. Generalized coordinates and Lagrange's equations. Dynamics of elastically connected masses. Influence coefficients, mode shapes and principal oscillations. Matrix methods for structural response. Transient stresses in an elastic structure. Wing divergence and aileron reversal. Theory of two dimensional oscillating airfoil. Flutter problems. Corrections for finite span. Random vibrations.

(Donaldson)

ENAE 280, 281. AERODYNAMICS OF VISCOUS FLUIDS. (3, 3)

Derivation of Navier Stokes equations, some exact solutions. Boundary layer equations. Laminar flow—similar solutions, compressibility, transformations, analytic approximations, numerical methods, stability and transition to turbulent flow. Turbulent flow—isotropic turbulence, boundary layer flows, free mixing flows. (This course is equivalent to ENME 280, 281).

(Schetz)

ENAE 290. SEMINAR.

(Credit in accordance with work outlined by Aerospace Engineering staff.)
First and second semesters.

ENAE 291, 292. SELECTED TOPICS IN AEROSPACE ENGINEERING. (3, 3)

Prerequisite, permission of instructor. Topics of current interest and recent advances in the field.

ENAE 399. THESIS RESEARCH. (Master's Level)

(Credit in accordance with work outlined by Aerospace Engineering staff.)
First and second semesters. Prerequisite, graduate standing.

(Staff)

ENAE 499. RESEARCH. (Doctoral Level)

(Credit in accordance with work outlined by Aerospace Engineering staff.)
First and second semesters.

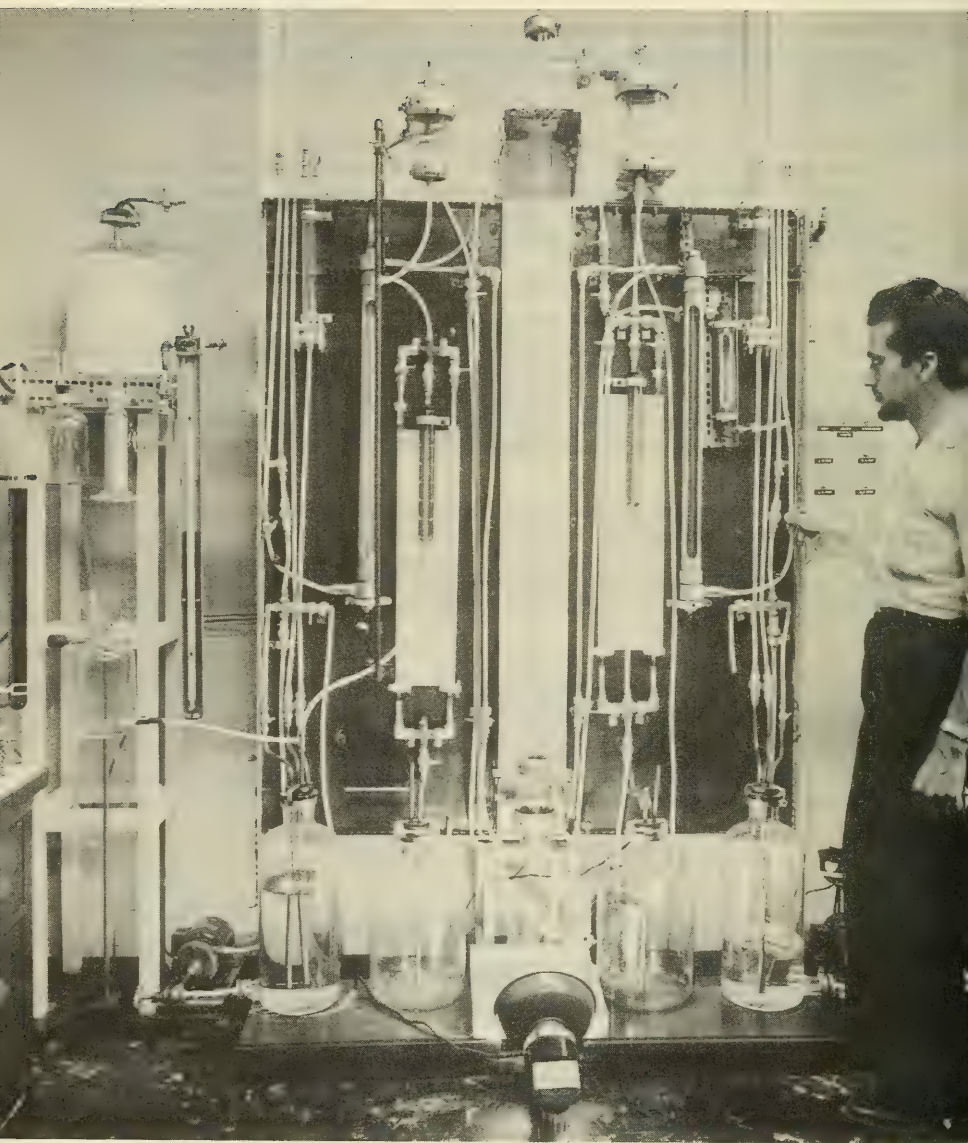
CHEMICAL ENGINEERING

Professors: BECKMANN, BISCHOFF, DUFFEY, GOMEZPLATA, JOHNSON, MARCHELLO, SCHROEDER, AND SILVERMAN.

Associate Professors: ARSENAULT, CADMAN, MUNNO, SKOLNICK, AND SMITH.

Assistant Professors: ALMENAS, BOLSAITIS, GENTRY, AND REGAN.

Lecturers: BELCHER, DEDRICK, GOLDMAN, AND MASI.



CHEMICAL ENGINEERING CURRICULUM

	Semester	
	I	II
SOPHOMORE YEAR		
MATH 021, 066—Analysis III, Differential Equations	4	3
PHYS 031, 032—General Physics	4	4
CHEM 035, 037—Elementary Organic Chem.	2	2
CHEM 040—Organic Chemistry Lab.	1	..
ENCH 015—Chemical Engineering Anal.	2	..
ENCH 050—Engineering Thermodynamics . . . . .	..	3
HLTH 005—Science and Theory of Health	(2)	..
General Education Course	3	3
ENES 020—Mechanics of Materials . . . . .	..	3
Total	16 or (18)	18
JUNIOR YEAR		
General Education Courses	3	3
ENCH 145—Chemical Engr. Kinetics . . . . .	..	3
ENCH 157—Chemical Engineering Systems Analysis and Dynamics . . . . .	..	2
ENCH 159—Dynamics and Control Lab. . . . .	..	1
CHEM 187, 189—Physical Chemistry	3	3
CHEM 188, 190—Physical Chemistry Lab.	2	2
Technical Elective	3	..
ENCH 109—Chemical Process Thermo	3	..
ENCH 127, 129—Transfer and Transport Processes I, II	4	3
Total	18	17
SENIOR YEAR		
General Education Courses*	3	3
ENEE Electives	3	..
ENCH 133—Seminar . . . . .	..	1
ENCH 137—Chemical Engineering Lab*	3	..
ENCH 147—Process Engr. and Design* . . . . .	..	3
ENCH 149—Chem. Engineering Econ . . . . .	..	2
ENCH—Electives	4	3
Technical Electives**	2	3
Total	15	15

*For Advanced Undergraduates and Graduates***ENCH 015. CHEMICAL ENGINEERING ANALYSIS. (2)**

Prerequisite, CHEM 003 or equivalent. Introduction to methods of chemical engineering analysis. Stoichiometric relations, correlation of chemical and physical properties, application of material and energy balances to chemical engineering operations and processes.

*Courses which may be scheduled either semester of the senior year.

**Technical electives must be on the 100 level. At least 3 hours must be in chemistry. The remainder may be in MATH, PHYS, CHEM, or Engineering including materials and nuclear.

ENCH 050. ENGINEERING THERMODYNAMICS. (3)

Prerequisite ENCH 015. Principles of thermodynamics and their application to engineering problems. First and second laws of thermodynamics, properties of gases, liquids and solids, phase equilibrium, flow and non-flow systems, energy conversion, production of work from heat, and thermodynamics of chemically reacting systems.

*For Advanced Undergraduates and Graduates***ENCH 109. CHEMICAL PROCESS THERMODYNAMICS. (3)**

Prerequisite, ENCH 050. Estimation of thermodynamic properties of pure substances and mixtures. Chemical and phase equilibria in ideal and non-ideal systems. Thermodynamic analysis of processes, equilibrium stage operations, thermodynamics of chemically reacting systems.

ENCH 116. APPLIED MATHEMATICS IN CHEMICAL ENGINEERING. (3)

Prerequisites, MATH 021. Mathematical technique applied to the analysis and solution of chemical engineering problems. Use of differentiation, integration, differential equations, partial differential equations and integral transforms. Application of infinite series, numerical and statistical methods.

ENCH 127, 129, 131. TRANSFER AND TRANSPORT PROCESSES I, II, II. (4, 3, 3)

First, second, and first semesters, respectively. Prerequisite, ENCH 050. A three semester sequence of courses covering the theory and applications of molecular and turbulent transport phenomena. Principles of fluid mechanics, mass, transfer and heat transfer. Dimensional analysis, analogy between heat, mass and momentum transfer, Newtonian and non-Newtonian flow, convective heat and mass transfer. Steady and unsteady state diffusion and conduction simultaneous heat and mass transfer, interphase transfer, boundary layer theory. The equilibrium stage concept and its application to absorption, extraction, and distillation. Analysis of multiple stage processes. Principles of radiant heat transfer, evaporation, filtration, crystallization, drying, condensation, boiling, humidification, ion exchange, and phase separations.

ENCH 133, 134. CHEMICAL ENGINEERING SEMINAR. (1, 1)

Prerequisite, Senior standing. Oral and written reports on recent developments in chemical engineering and the process industries. Fall and Spring Semesters.

ENCH 137. CHEMICAL ENGINEERING LABORATORY. (3)

First or second semester. Prerequisite, ENCH 129. Application of chemical engineering process and unit operation principles in small scale semi-commercial equipment. Data from experimental observations are used to evaluate performance and efficiency of operations. Emphasis is placed on correct presentation of results in report form.

ENCH 140. INTRODUCTION TO NUCLEAR TECHNOLOGY. (2)

First and second semesters. Two lectures a week. Prerequisites, MATH 021 and PHYS 021. Engineering problems of the nuclear energy complex, including basic theory, nuclear reactor design, and isotopic and chemical separations. Emphasis is on the nuclear fission reactor.

ENCH 142. ENVIRONMENTAL CONSIDERATION OF NUCLEAR ENGINEERING. (3)

First semester. Three lectures a week. Prerequisite, permission of instructor. Protection of the public and the environment from the hazards of nuclear energy operations. Handling and disposal of gaseous, liquid and solid radio-

active wastes. Meteorological, hydrological and geological operations and chemical separations. Legislative and economic factors, site selection, plant design and operation as related to the environment. (Silverman, Munno.)

ENCH 145. CHEMICAL ENGINEERING KINETICS. (3)

First semester. Prerequisite, ENCH 050. Fundamentals of chemical reaction kinetics and their application to the design and operation of chemical reactors. Reaction rate theory, homogeneous reactions in batch and flow systems, adsorption, heterogeneous reactions and catalysis, electrochemical reactions. Catalytic reactor design.

ENCH 147. PROCESS ENGINEERING AND DESIGN. (3)

Second or first semester. Prerequisite, ENCH 129. Utilization of chemical engineering principles for the design of process equipment. Typical problems in the design of chemical plants. Comprehensive reports are required.

ENCH 148. NUCLEAR TECHNOLOGY LABORATORY. (3)

One lecture and two laboratory periods a week. Prerequisites, CHEM 003, PHYS 021, MATH 021, ENCH 140, or equivalent, and permission of instructor. Techniques of detecting and making measurements of nuclear or high energy radiation. Radiation safety experiments. Both a sub-critical reactor and the 10-KW swimming pool critical reactor are sources of radiation.

(Silverman, Munno.)

ENCH 149. CHEMICAL ENGINEERING ECONOMICS. (2)

Second semester. Prerequisite, ENCH 129. Principles of engineering economics applied to chemical processes. Optimizing methods in the design and operation of industrial processes. Determination of investment and operating costs for chemical plants.

ENCH 150. CHEMICAL PROCESS DEVELOPMENT. (3)

First semester. Prerequisite, ENCH 129. Chemical process industries from the standpoint of technology, raw materials, products and processing equipment. Operations of the major chemical processes and industries combined with quantitative analysis of process requirements and yields.

ENCH 152. ADVANCED CHEMICAL ENGINEERING ANALYSIS. (3)

Second semester. Prerequisite, ENCH 109. Application of digital and analog computers to chemical engineering problems. Numerical methods, programming, differential equations, curve fitting, amplifiers and analog circuits.

ENCH 154. NUMERICAL AND STATISTICAL ANALYSIS. (2)

Second semester. Prerequisite, ENCH 116. Use of probability and statistics in chemical engineering. Probability, normal distribution and measure of variability. The chi square, and the t-test. Correlation and regression analysis. Introduction to analysis of variance and sequential analysis.

ENCH 155. CHEMICAL PROCESS LABORATORY. (2)

First semester. Prerequisite, ENCH 129 and 145. Experimental study of various chemical processes through laboratory and small semi-commercial scale equipment. Reaction kinetics, fluid mechanics, heat and mass transfer.

ENCH 157. CHEMICAL ENGINEERING SYSTEMS ANALYSIS AND DYNAMICS. (2)

Prerequisite, Differential Equations or ENCH 116. Dynamic response applied to process systems. Goals and modes of control, Laplace transformations, analysis and synthesis of simple control systems, closed loop response, dynamic testing.

ENCH 159. DYNAMICS AND CONTROL LABORATORY. (1)

Prerequisite, ENCH 157 concurrently. Methods of process control. Use of experimental analog and mathematical models of control systems.

ENCH 161. UNIT OPERATIONS AND PROCESSES OF AIR POLLUTION CONTROL. (3)

Prerequisites, senior standing in engineering or consent of instructor. Theory and application of methods for the control and removal of airborne materials. Principles of design and performance of air quality control equipment.

(Marchello)

ENCH 165. RESEARCH. (2 or 3)

First and second semesters. Prerequisite, permission of the staff. Investigation of a research project under the direction of one of the staff members. Comprehensive reports are required.

ENCH 170. STRUCTURE AND PROPERTIES OF ENGINEERING MATERIALS. (3)

A comprehensive survey of the atomic and electronic structure of solids with emphasis on the relationship of structure to the physical and mechanical properties.

ENCH 171. PHYSICAL CHEMISTRY OF ENGINEERING MATERIALS. (3)

Equilibrium multicomponent systems and relationship to the phase diagram. Thermodynamics of polycrystalline and polyphase materials. Diffusion in solids, kinetics of reactions in solids.

ENCH 172. TECHNOLOGY OF ENGINEERING MATERIALS. (3)

Relationship of properties of solids to their engineering applications. Criteria for the choice of materials for electronic, mechanical and chemical properties. Particular emphasis on the relationships between structure of the solid and its potential engineering application.

ENCH 173. PROCESSING OF ENGINEERING MATERIALS. (3)

The effect of processing on the structure of engineering materials. Processes considered include refining, melting and solidification, purification by zone refining, vapor phase processing, mechanical working and heat treatments.

*For Graduates***ENCH 201. GRADUATE SEMINAR. (1)**

First and second semesters. Discussion of current advances and research in chemical engineering. Presented by graduate students and staff.

ENCH 203. CHEMICAL ENGINEERING THERMODYNAMICS. (3)

First semester. Advanced application of the general thermodynamic methods to chemical engineering problems. First and second law consequences, estimation and correlation of thermodynamic properties, phase and chemical reaction equilibria.

(Smith.)

ENCH 205. TRANSPORT PHENOMENA. (3)

First semester. Heat, mass and momentum transfer theory from the viewpoint of the basic transport equations. Steady and unsteady state, laminar and turbulent flow, boundary layer theory, mechanics of turbulent transport, with specific application to complex chemical engineering situations.

(Marchello, Regan.)

ENCH 207. TRANSFER OPERATIONS. (3)

Second semester. Prerequisite, ENCH 205. Applications of heat, mass and momentum transfer theory to chemical engineering problems. Transfer coefficients, heat, mass and momentum analogies, two-phase flow, boiling and condensation, radiation heat transfer.

(Marchello, Regan)

ENCH 209. COMPLEX EQUILIBRIUM STAGE PROCESSES. (3)

Second semester. The theory and application of complex equilibrium stages. Binary and multicomponent distillation, multicomponent absorption, extraction, liquefaction.

ENCH 211. ADVANCED CHEMICAL REACTION KINETICS. (3)

Second semester. The theory and application of chemical reaction kinetics to reactor design. Reaction rate theory, homogenous batch and flow reactors, fundamentals of catalysts, design of heterogeneous flow reactors.

(Gomezplata, Bischoff)

ENCH 223. PROCESS ENGINEERING AND DESIGN. (3)

Coordination of chemical engineering and economics to advanced process engineering and design. Optimization of investment and operating costs. Solution of typical problems in the design of chemical engineering plants.

(Schroeder.)

ENCH 235. CHEMICAL PROCESS DYNAMICS. (3)

First semester. Prerequisites, differential equations or consent of instructor. Analysis of open and closed control loops and their elements, dynamic response of processes, choice of variables and linkages, dynamic testing and synthesis, noise and drift, chemical process systems analysis, strategies for optimum operation.

(Smith, Cadman.)

ENCH 247. SPECIAL PROBLEMS IN CHEMICAL ENGINEERING.

First and second semesters. Special study and/or investigation in chemical engineering under the direction of an assigned faculty advisor. Since content changes, re-registration is permissible.

(Staff.)

ENCH 253. ADVANCED TOPICS IN THERMODYNAMICS. (3)

Prerequisite, ENCH 203.

(Staff.)

ENCH 255. ADVANCED TOPICS IN CHEMICAL REACTION SYSTEMS. (3)

Prerequisite, ENCH 211.

(Beckmann.)

ENCH 257. ADVANCED TOPICS IN TRANSFER THEORY. (3)

Prerequisite, ENCH 207.

(Bischoff.)

ENCH 259. ADVANCED TOPICS IN SEPARATION PROCESSES. (3)

(Marchello.)

ENCH 301. SEMINAR IN NUCLEAR ENGINEERING. (1)

First and second semesters, one meeting a week. Survey of nuclear engineering literature, and oral presentation of prepared reports. Since the content of this course is changing, a student may receive a number of credits by re-registration.

(Duffey, Silverman, Munno.)

ENCH 302, 303. NUCLEAR REACTOR ENGINEERING. (3, 3)

First and second semesters. Three lectures a week. Prerequisite, permission of instructor. Design, construction and operation of typical nuclear reactors, including general design, nuclear reactor theory, materials of construction, heat transfer, and control.

(Duffey, Munno.)

ENCH 308, 309. NUCLEAR REACTOR LABORATORY. (3, 3)

Two lectures and two laboratory periods a week. Prerequisites, permission of instructor, ENCH 148, 302, or equivalent. The University of Maryland 10-KW swimming pool is employed in experiments on reactor startup and operation, shielding, control, neutron flux distributions, neutron and gamma spectrum, cross section measurements.

(Staff)

ENCH 311. NUCLEAR FUEL AND WASTE PROCESSING. (3)

First semester. Three lectures a week. Processing of nuclear fuel and treatment of nuclear waste. Includes: (1) processing of uranium, thorium, and other ores; (2) chemical separation of plutonium, uranium, fission products and other elements from materials irradiated in nuclear reactors; (3) treatment of radioactive wastes; (4) isotopic separation of U235; and (5) isotopic separation of heavy water and other materials. (Silverman)

ENCH 313. SELECTED TOPICS IN NUCLEAR ENGINEERING. (2)

Two lectures a week. Prerequisite, permission of instructor. Topics of current interest and recent advances in the nuclear engineering field. Because of the rapid advances in the field, information on special topics of much practical importance is continually becoming available. Since the content changes, re-registration may be permitted. (Duffey, Silverman, Munno.)

ENCH 314. SPECIAL PROBLEMS IN NUCLEAR ENGINEERING.

Credit hours to be arranged. Prerequisite, consent of instructor. (Staff.)

ENCH 315, 316. RADIATION ENGINEERING. (3, 3)

Second semester. Two lectures a week. Prerequisite, permission of instructor. An analysis of such radiation applications as synthesizing chemicals, preserving foods, control of industrial processes. Design of irradiation installations, e.g., cobalt 60 gamma ray sources, electronuclear machine arrangements, and chemo-nuclear reactors. (Silverman.)

ENCH 317. RADIATION EFFECTS LABORATORY. (3)

Prerequisite, permission of instructor. Effect of massive doses of radiation on the properties of matter for purposes other than those pointed toward nuclear power. Radiation processing, radiation-induced chemical reactions, and conversion of radiation energy, isotope power sources. (Silverman.)

ENCH 320. NUCLEAR REACTOR PHYSICS I. (3)

First semester. Introduction to neutron physics. The theory of neutron detection instruments including the neutron chopper and solid state detectors. Elements of neutron slowing-down theory. The Boltzman transport equation will be developed together with approximations such as Pn, Sn, and Fermi Age. Nuclear systems will be theoretically treated utilizing the diffusion approximation, the Fermi Age method and the P-3 method. Elementary temperature and time dependence. (Munno.)

ENCH 321. NUCLEAR REACTOR PHYSICS II. (3)

Second semester. Prerequisite, ENCH 320. Mathematical treatment of nuclear reactor systems. To be presented in this course are the foundations of nuclear reactor kinetics, the multigroup treatment, reflected reactor theory, heterogeneous reactors, perturbation theory. Thermalization theory and the pulse and sine-wave techniques. Introduction to variational methods. (Munno.)

ENCH 331. NEUTRAL PARTICLE TRANSPORT THEORY. (3)

First semester. Prerequisite, ENCH 320 or permission of instructor. Transport equations for neutrons and gamma rays. Infinite space and Milne problems. Spherical harmonic and variational methods. Special methods of solving transport equations.

ENCH 333. RADIATION SHIELDING AND ENERGY DEPOSITION. (3)

First semester. Prerequisite, ENCH 320 or permission of instructor. A study of the interactions of nuclear radiations with matter. Includes electron, gamma and neutron attenuation, dose calculations, chemical changes, heat generation and removal in shields.

ENCH 337. NUCLEAR REACTOR DYNAMICS. (3)

Second semester. Prerequisites, ENCH 321. Principles of reactor control and operation. Neutron kinetics, temperature and coolant flow effects, transfer function, stochastic processes. Stability analysis. Accident calculations. Use of analog computer for simulation and problem solving.

ENCH 350. STRUCTURE OF ENGINEERING MATERIALS. (3)

The structural aspects of crystalline and amorphous solids and relationship to bonding types. Point and space groups. Summary of diffraction theory and practice. The Reciprocal Lattice. Relationships of the microscopically measured properties to crystal symmetry. Structural aspects of defects in crystalline solids.

ENCH 351. ELECTRONIC STRUCTURE OF ENGINEERING SOLIDS. (3)

Prerequisite, ENCH 350 or ENME 350. Description of electronic behavior in engineering solids. Behavior of conductors, semiconductors and insulators in electrical fields. Thermal, magnetic and optical properties of engineering solids.

ENCH 359. SPECIAL TOPICS IN STRUCTURE OF ENGINEERING MATERIALS. (3)

Prerequisite, consent of instructor.

ENCH 360. CHEMICAL PHYSICS OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. Thermodynamics and statistical mechanics of engineering solids. Cohesion, thermodynamic properties. Theory of solid solutions. Thermodynamics of mechanical, electrical and magnetic phenomena in solids. Chemical thermodynamics, phase transitions and thermodynamic properties of polycrystalline and polyphase materials. Thermodynamics of defects in solids.

ENCH 361. KINETICS OF REACTIONS IN MATERIALS. (3)

Prerequisite, ENCH 360 or ENME 360. The theory of thermally activated processes in solids as applied to diffusion, nucleation and interface motion. Cooperative and diffusionless transformations. Applications selected from processes such as allotropic transformations, precipitation, martensite formation, solidification, ordering, and corrosion.

ENCH 369. SPECIAL TOPICS IN THE CHEMICAL PHYSICS OF MATERIALS. (3)

Prerequisite, consent of instructor.

ENCH 370. RHEOLOGY OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. Mechanical behavior with emphasis on the continuum point of view and its relationship to structural types. Elasticity, viscoelasticity, anelasticity and plasticity in single phase and multiphase materials.

ENCH 371. DISLOCATIONS IN CRYSTALLINE MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. The nature and interactions of defects in crystalline solids, with primary emphasis on dislocations. The elastic and electric fields associated with dislocations. Effects of imperfections on mechanical and physical properties.

ENCH 372. MECHANICAL PROPERTIES OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 370 or ENME 370. The mechanical properties of single crystals, polycrystalline and polyphase materials. Yield strength, work hardening, fracture, fatigue and creep are considered in terms of fundamental material properties.



ENCH 379. SPECIAL TOPICS IN THE MECHANICAL BEHAVIOR OF ENGINEERING SOLIDS. (3)

Prerequisite, consent of instructor.

ENCH 380. EXPERIMENTAL METHODS IN MATERIALS SCIENCE. (3)

Methods of measuring the structural aspects of materials. Optical and electron microscopy. Microscopic analytical techniques. Resonance methods. Electrical, optical and magnetic measurement techniques. Thermodynamic methods.

ENCH 381. DIFFRACTION TECHNIQUES IN MATERIALS SCIENCE. (3)

Prerequisite, ENCH 350 or ENME 350. Theory of diffraction of electrons, neutrons and x-rays. Strong emphasis on diffraction methods as applied to the study of defects in solids. Short range order, thermal vibrations, stacking faults, microstrain.

ENCH 389. SPECIAL TOPICS IN EXPERIMENTAL TECHNIQUES IN MATERIALS SCIENCE. (3)

Prerequisite, consent of instructor.

ENCH 390. POLYMERIC ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350 or consent of instructor. A comprehensive summary of the fundamentals of particular interest in the science and applications of polymers. Polymer single crystals, transformations in polymers, fabrication of polymers as to shape and internal structure.

ENCH 391. SPECIAL TOPICS IN MATERIALS TECHNOLOGY. (3)

Prerequisite, consent of instructor.

ENCH 397. SEMINAR IN ENGINEERING MATERIALS. (1)

Discussion of current advances and research in engineering solids.

ENCH 398. SPECIAL PROBLEMS IN ENGINEERING MATERIALS.

Special study or investigation in Materials Science under the direction of an assigned faculty advisor. Credit variable and since content changes, re-registration is permissible.

ENCH 399. RESEARCH IN CHEMICAL ENGINEERING. RESEARCH IN NUCLEAR ENGINEERING. RESEARCH IN ENGINEERING MATERIALS. (M.S. Level)

Credit hours to be arranged. (Research in Chemical Engineering.) (Research in Nuclear Engineering). The investigation of special problems and the preparation of a thesis in partial fulfillment of the requirements of an advanced degree.
(Staff)

ENCH 499. DOCTORAL DISSERTATION (Ph.D. Level)

CIVIL ENGINEERING

Professors: LOONEY, LEPPER AND OTTS.

Associate Professors: COOKSON, COUNYIN, GARBER, GOHR, KONDNER, PIPER, RAGAN, WEDDING.

Assistant Professors: BIRKNER, HEINS, ISRAEL, REILLY, AND SCHELLING.

Instructors: DUNPHY.

Lecturers: BLOEM, BYINGTON, DESROSIERS, RAJAN, AND WALKER.

CIVIL ENGINEERING CURRICULUM

	Semester	
	I	II
SOPHOMORE YEAR		
General Education Courses.....	3	3
PHYS 031, 032—General Physics.....	4	4
MATH 021, 022—Analysis III, IV.....	4	4
HLTH 005—Science and Theory of Health.....	..	(2)
ENES 020—Mechanics of Materials.....	3	..
ENES 021—Dynamics.....	..	3
ENCE 050—Fundamentals of Engineering Materials.....	3	..
ENCE 090—Engr. Survey Measurements.....	..	3
	<hr/>	<hr/>
Total.....	17	17
		or (19)
JUNIOR YEAR		
General Education Course.....	..	3
ECON 037—Fundamentals of Economics.....	3	..
ENCE 100—Numerical Analysis and Computer Programming.....	..	3
ENCE 112—Applied Math in Engr.....	3	..
ENME 105—Principles of Mech. Engr.....	3	..
ENCE 102—Fundamentals of Structural Analysis.....	3	..
ENCE 103—Basic Structural Design.....	..	3
ENCE 105—Basic Fluid Mechanics.....	3	..
ENCE 106—Fundamentals of Sanitary Engineering.....	..	3
ENCE 107—Basic Soil Mechanics.....	..	3
ENCE 108—Fundamentals of Transportation Engineering ..	3	..
ENEE 050—Fundamentals of Elec. Engr.....	..	3
	<hr/>	<hr/>
Total.....	18	18
SENIOR YEAR		
General Education Courses.....	3	3
ENCE 104—Computer Analysis.....	3	..
ENCE 109, 110—Basic Civil Engineering Planning.....	2	1
Technical Electives (See Note B).....	6*	9*
Extra-Departmental Electives (See Note A).....	3	3
	<hr/>	<hr/>
Total.....	17	16

NOTES CONCERNING ELECTIVES:

The student shall, with the assistance of his advisor, select a coherent program of electives in accordance with the following

- A. Six (6) elective credits (two courses) must be taken outside the Department. Three credits must be in a field related to economics, management or business law. The other three are at the choice of the student.
- B. Five technical elective courses (15-17 credits) must be taken as specified below:

*These numbers represent five three-semester-credit courses. Additional semester credits will be involved to the extent that courses carrying more than three credits are selected.

- (1) A two course sequence, in the order shown, must be taken from one of the following five.
 - (a) ENCE 125, 126
 - (b) ENCE 165, 166
 - (c) ENCE 175, 176
 - (d) ENCE 185, 186
 - (e) ENCE 135, 155
 - (f) ENCE 146, 147
- (2) Three courses may be selected from any listed in part B (1) above or from the following:
 - (a) ENCE 136
 - (b) ENCE 145
 - (c) ENCE 187
 - (d) ENCE 188
 - (e) ENCE 195
 - (f) ENCE 199
 - (g) ENCE 127
 - (h) or, with departmental approval, one of the three may be a

ENCE 050. FUNDAMENTALS OF ENGINEERING MATERIALS. (3)

First and second semester. Two lectures and one laboratory per week. Prerequisite, ENCE 20, or concurrent registration. Properties and constitution of the principal materials used in civil engineering; laboratory tests for these properties, interpretation of test results and of specifications.

ENCE 090. ENGINEERING SURVEY MEASUREMENTS. (3)

First and second semester. Two lectures and one laboratory per week. Prerequisite, MATH 020, or concurrent registration. Standards, units, calibration; measurement of distance, elevation, angles; systematic and random error analysis in measurements; fundamentals of mapping; instrumentation.

For Advanced Undergraduates and Graduates

ENCE 100. ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)

Second semester. Three lectures per week. Prerequisite, ENCE 112 or concurrent registration. Elements of operational calculus, vector analysis, numerical methods and programming for computers. Errors, interpolation, series, integration, iteration and solution of equations. (Garber.)

ENCE 102. FUNDAMENTALS OF STRUCTURAL ANALYSIS. (3)

First semester. Three lectures per week. Prerequisites, ENES 020 and ENCE 050. Basic statics and mechanics of structural systems. Introduction to indeterminate analysis. (Piper.)

ENCE 103. BASIC STRUCTURAL DESIGN. (3)

Second semester. Three lectures per week. Prerequisite, ENCE 102. Basic elements of structural design of wood, steel and concrete without dependence on individual specifications. Classical design of beams, trusses, columns, connections and foundations. (Piper.)

ENCE 104. COMPUTER ANALYSIS. (3)

First semester. Two lectures and one laboratory per week. Prerequisites, ENCE 100 and ENCE 102. Computer methods and techniques applied to Civil Engineering problems with emphasis on structural systems. (Garber.)

ENCE 105. BASIC FLUID MECHANICS. (3)

First semester. Three lectures per week. Prerequisites, ENCE 020, 021, PHYS 020. Prerequisite, ME 105, or concurrent registration. The study of fluids at rest and in motion. Principles of viscous turbulent flow. Impulse and momentum concepts. Pumps, turbines and meters. Dimensional analysis and laws of similarity. (Cournyn.)

ENCE 106. FUNDAMENTALS OF SANITARY ENGINEERING. (3)

Second semester. Three lectures per week. Prerequisite, ENCE 105. An introduction to the basic principles for the development of water supplies, control of pollution and design and operation of water purification and waste water disposal facilities. (Otts, Cookson.)

ENCE 107. FUNDAMENTALS OF SOIL MECHANICS. (3)

Second semester. Three lectures per week. Prerequisites, ENES 020 and ENCE 050. Introductory study of the mechanics of aggregations and its application to earthworks and foundations. Engineering geology relative to civil engineering and soil mechanics. (Kondner.)

ENCE 108. FUNDAMENTALS OF TRANSPORTATION ENGINEERING. (3)

First semester. Prerequisite, ENCE 050 and ENCE 090. Engineering problems of transportation by airways, highways, pipe-lines, railways and waterways. Elementary dynamics of traffic and functional consideration of routes and terminals. (Wedding, Byington.)

ENCE 109. BASIC CIVIL ENGINEERING PLANNING. I. (2)

First semester. Two lectures per week. Prerequisites, ENCE 103, 106, 107, and 108. Lectures in the methodology used in the application of the Basic Civil Engineering Courses to the general practice of Civil Engineering but with special emphasis on planning of extensive civil engineering works. In addition, preparation of engineering reports, specifications and project presentation, economics, functional aspects. (Piper.)

ENCE 110. BASIC CIVIL ENGINEERING PLANNING II. (1)

Second semester. One laboratory of three hours per week. Prerequisite, ENCE 109. Laboratory for application of the program and principles developed in Basic Civil Engineering Planning I. (Piper.)

ENCE 112. APPLIED MATHEMATICS IN ENGINEERING. (3)

First semester. Three lectures per week. Prerequisite, MATH 022. Mathematical technique applied to the analysis and solution of engineering problems. Use of differentiation, integration, differential equations, and integral transforms. Application of infinite series numerical, and statistical methods. (Garber and Schelling.)

TECHNICAL ELECTIVES**ENCE 125. ADVANCED STRENGTH OF MATERIALS. (3)**

First semester. Three lectures per week. Prerequisite, ENCE 020. Strength and deformation of deformable bodies, plane stress and strain. Torsion theory, unsymmetrical bending, curved beams. Behavior of beams, columns, slabs, plates and composite members unload. Elastic and inelastic stability. (Lepper.)

ENCE 126. EXPERIMENTAL STRESS ANALYSIS. (4)

Second semester. Three lectures and one laboratory per week. Application of experimental data on materials to design problems. Correlation of analytical and experimental methods of analysis with design. Electric strain gages, photoelasticity, brittle lacquer methods and various analogies. (Lepper, Wedding.)

ENCE 127. THEORY OF ELASTICITY AND PLASTICITY. (3)

Three lectures per week. Prerequisites, ENES 020 and ENCE 112. General formulation of the theory of mechanics of deformable media in terms of cartesian tensors. Plane state of stress, torsion of various shaped bars and thin walled sections. Bending and buckling of bars and thin plates. Introduction to the theory of plates and shells.

ENCE 135. ADVANCED SOIL MECHANICS. (4)

Three lectures and one laboratory per week. Prerequisite, ENCE 107. Theories of strength, compressibility, capillarity and permeability. Critical review of theories and methods of measuring essential properties. Planning, execution and interpretation of soil testing programs. (Kondner.)

ENCE 136. SOIL-FOUNDATION SYSTEMS. (3)

Three lectures per week. Soil mechanics and foundation analysis are integrated in a systems approach to the design, synthesis, and interaction response of soil-foundation-structural systems. Interaction of bearing capacity, settlements, lateral pressures, drainage, vibrations, stress distributions, etc. are included for a variety of structural systems. (Kondner)

ENCE 145. ADVANCED FLUID MECHANICS. (4)

Three lectures and one laboratory per week. Prerequisite ENCE 105. The study of the properties and flow of an ideal fluid. Viscosity, laminar and turbulent flow, flow nets, uniform flow, source, irrotational motion and circulation. Turbulence and boundary layers. (Cournyn and Rajan.)

ENCE 146. HYDROLOGIC ANALYSIS AND DESIGN. (3)

Prerequisites ENCE 100, ENCE 105; Concurrent registration in ENCE 104 or permission of instructor. Study of the physical processes of the hydrologic cycle; hydrometeorology; concept of weather modification; evaporation and transpiration; infiltration studies; run off computations; flood routing; reservoir requirements; emphasis on process simulation as a tool in water resource development. (Ragan.)

ENCE 147. GROUND WATER HYDROLOGY. (3)

Prerequisites ENCE 104, ENCE 105, or permission of instructor. Concepts related to the development of the ground water resource; hydrogeology; hydrodynamics of flow through porous media; hydraulics of wells; artificial recharge; sea water intrusion; basin-wide ground water development. (Ragan.)

ENCE 155. ADVANCED MATERIALS OF ENGINEERING. (3)

Three lectures per week. Prerequisite, ENCE 050. Mechanisms of the behavior of materials under repeated, sustained and impact loads in relation to their environment. Influence of microstructure on mechanical properties. Fracture theory. Rheological aspects of the characteristics of selected materials. (Wedding.)

ENCE 165. STRUCTURAL ANALYSIS. (3)

First semester. Three lectures per week. Prerequisite, ENCE 103. Advanced indeterminate structures, members of variable section, laterally loaded frames, continuous trusses and secondary stresses. (Heins.)

ENCE 166. STRUCTURAL DESIGN. (4)

Second semester. Three lectures and one laboratory per week. Prerequisite, ENCE 103. Steel and reinforced concrete design of bridges and buildings using appropriate controlling specifications. Advanced problems of modern steel and reinforced concrete. (Heins.)

ENCE 175. SANITARY ENGINEERING ANALYSIS AND DESIGN. (4)

Second semester. Three lectures and one laboratory per week. Prerequisite,

ENCE 106. The application of sanitary analysis and fundamental principles to the design and operation of water and waste water treatment plants and the control of stream pollution. (Otts and Cookson.)

ENCE 176. ENVIRONMENT HEALTH ENGINEERING ANALYSIS. (3)

First semester. Two lectures and one laboratory per week. The theory and analytical techniques used in evaluating man's environment. Emphases are given to the areas of quantitative, physical, electroanalytical and organic chemistry as applied to chemical analysis of water. (Birkner.)

ENCE 185. HIGHWAY ENGINEERING. (3)

First semester. Three lectures per week. Prerequisite, ENCE 107. Location, design, construction and maintenance of roads and payments. Introduction to traffic engineering. (Wedding and Dunphy.)

ENCE 186. TRANSPORTATION ENGINEERING. (3)

Second semester. Three lectures per week. Prerequisite, ENCE 108. A study of the principles of transportation engineering as applied to the various modes of transport. Consideration is given to cost analysis, economic aspects of route and site selection and layout. The organization and administration of engineering functions. (Wedding and Dunphy.)

ENCE 187. ENGINEERING ANALYSIS OF TRANSPORTATION SYSTEMS I. (3)

Prerequisite: ENCE 186 or consent of instructor. Application of the principles of engineering economy and statistics to the solution of transportation problems. Economic comparison of alternatives using present worth, annual cost, rate of return and cost benefit analyses. Development and use of simple and multiple regression models, and statistical decision theory. (Staff.)

ENCE 188. ENGINEERING ANALYSIS OF TRANSPORTATION SYSTEMS II. (3)

Prerequisite: ENCE 186 or consent of instructor. Application of iconic, analytic, numeric, and probabilistic models to the solution of transportation problems. Existing inventory, allocation, replacement, and competitive models are examined. Emphasis is on model construction and solution, and implementation of the obtained solutions. (Staff.)

ENCE 195. ADVANCED SURVEYING. (3)

Two lectures and one laboratory per week. Prerequisite, ENCE 090. Advanced surveying theory and practice including triangulation, topographic surveying, astronomical observations, map systems, state plane coordinates, map interpretation, vertical and horizontal alignment. Computer applications.

ENCE 199. SPECIAL PROBLEMS. (3)

Prerequisite, senior standing. A course arranged to meet the needs of exceptionally well prepared students for study in a particular field of Civil Engineering. (Staff.)

For Graduates

ENCE 221, 222. ADVANCED STRENGTH OF MATERIALS. (3, 3)

First and second semesters. Prerequisites, ENES 020, 021, and ENCE 050 or equivalent. Analyses for stress and deformation in engineering members by the methods of mechanics of materials and elementary theories of elasticity and plasticity. Problems in flexure, torsion, plates and shell, stress concentrations, indeterminate combinations, residual stresses, stability. (Lepper.)

ENCE 223. EXPERIMENTAL STRESS ANALYSIS. (3)

Second semester. Prerequisite, ENCE 21 or permission of instructor. Experimental methods of stress and strain analysis for static and impact forces. Structural models, brittle and plastic material methods; analogies; photoelasticity; optical, mechanical and electrical strain gages and instrumentation. (Wedding.)

ENCE 224. ADVANCED ENGINEERING MATERIALS LABORATORY. (3)

First or second semester. Prerequisite, ENES 020, 021 and ENCE 050 or equivalent. Critical examination of the methods for testing engineering materials and structures under static, repeated, sustained and impact forces. Laboratory experiments for the determination of strength and stiffness of structural alloys, concrete and other construction materials. Examination of the effects of test factors on the determination of engineering properties. (Lepper, Wedding.)

ENCE 225, 226. ADVANCED PROPERTIES OF MATERIALS. (3, 3)

First and second semesters. Prerequisites, ENCE 221, 22. Modern theories of the structure of matter applied to the study of elastic and plastic deformation of materials under static, repeated, sustained and impact forces. Elements of solids state physics, crystal structure, slip and dislocation theory; polycrystalline solids. Effects of low and high temperature, loading rates, and state of stress on mechanical properties and fracture. Critical study of tests and their application to strength of members. (Lepper.)

ENCE 227, 228. THEORIES OF CONCRETE AND GRANULAR MATERIALS. (3, 3)

First and second semester. Prerequisites, ENCE 221, 22 and 224. Critical reviews of analytical and experimental investigations of the behavior of concretes under diverse conditions of loading and environment. Mechanics of granular aggregates and the chemistry of cements. Theories of the design of portland cement and field experience. (Wedding.)

ENCE 241. HYDRAULIC ENGINEERING. (3)

Prerequisite, ENCE 105 or equivalent. Water power and flood control. Analysis of the principal features of a water power project with special reference to reservoir, waterway, dam, plant accessories, and power house equipment. Complete report on a water power project required, including costs and power valuation. (Cournyn.)

ENCE 242. ADVANCED HYDROLOGIC ANALYSIS. (3)

Prerequisites: ENCE 146, MATH 133, or consent of instructor. Study of physical processes controlling watershed runoff; the use of process simulation and cross-correlation techniques for the analysis of streamflow records; use of stochastic models for the synthesis of critical patterns of low and high streamflows. (Ragan.)

ENCE 243. FREE SURFACE FLOW. (3)

Prerequisite: ENCE 105 or consent of instructor. Application of fundamentals of fluid mechanics to design problems involving steady and unsteady open channel flow; boundary resistance for uniform and non-uniform conditions; computation of water surface profiles in channels and reservoirs; hydraulic jump; design of flow transition structures; stratified flows. (Ragan.)

ENCE 251. SOIL MECHANICS. (3)

Prerequisites, ENCE 107, 165, and 166 or equivalent. Identification properties tests and classification methods for earth materials. Strength and deformation characteristics, hydraulic properties and permeability, shearing resistance, compressibility and consolidation, with laboratory tests for these properties. Study of the basic theories involved and the development of test procedures. (Kondner.)

ENCE 252. ADVANCED FOUNDATIONS. (3)

Prerequisites, ENCE 107, 165, and 166 or equivalent. Principles of mechanics applied to engineering problems in foundations. Earth pressure theories, seepage and drainage phenomena, stability of footings and slopes, stress and deformation in soils, consolidation theory and application to foundation settlements. (Kondner.)

ENCE 255. DYNAMICS OF STRUCTURES. (3)

Second semester. Prerequisite, ENCE 112, 102, and 103 or equivalent. Analysis and design of structures subjected to dynamic loads. Hamilton's Principle and Lagrange's Equations. Rayleigh's Principle. Fourier and transform methods. Numerical and matrix methods used to solve continuous and lumped mass systems. Application to earthquake design, blast resistant structures, bridge vibration, and other civil engineering problems. (Schelling)

ENCE 256. MATRIX METHODS OF STRUCTURAL ANALYSIS. (3)

Prerequisite, ENCE 127 and ENCE 112 or equivalent. Review of basic structural and matrix theory. Use of virtual work and complementary virtual work to develop in parallel the displacement and force method for determinate and indeterminate civil engineering structures. Stiffness and flexibility matrices. Initial and thermal strain, modification and cutout procedure. Comparison of flexibility and displacement methods. Introduction to the dynamic response of structures using mode superposition and matrix methods.

ENCE 257. ANALYSIS OF PLATE AND SHELL STRUCTURES. (3)

Prerequisite, ENCE 125, ENCE 127 and ENCE 112 or equivalent. Review of fundamental formulas from the theory of surfaces. General theory for membranes stresses, bending stresses, deformation and stability of thin plates and shells. Application of the theory to civil engineering structures such as hyperbolic paraboloids, cylindrical shells, shells of revolution, shells of arbitrary shape, folded plates. (Heins.)

ENCE 258. ADVANCED ELASTICITY. (3)

Prerequisite, ENCE 125, ENCE 127 and ENCE 112 or equivalent. Review of vector and tensor calculus. Invariant formulation of nonlinear theory including effect of large displacements, finite rotations and finite deformations. Stability of equilibrium configurations. Special civil engineering problems solved by finding the system of forces which is necessary to maintain the deformed body in equilibrium. Theory of successive approximations.

ENCE 259. NONLINEAR THEORY OF SHELL STRUCTURES. (3)

Prerequisite, ENCE 257 and ENCE 258. General formulation of a nonlinear theory of shells of arbitrary shape occurring in civil engineering structures utilizing basic concepts from vector and tensor analysis. Large deflections and rotations are considered consistent with the existence of a strain energy function which permits the derivation of a stress-strain relation. The shell problem is reduced to one of two dimensions by various procedures. After the general theory governing the equilibrium configuration of a shell structure is established, the condition of stable and unstable equilibrium is considered.

ENCE 260. PLASTIC ANALYSIS AND DESIGN OF STRUCTURES. (3)

First semester. Prerequisite, permission of instructor. Theory of plasticity and its application to structural design. The behavior of steel structures beyond the elastic limit and up to collapse. Study of component parts of frames; methods of predicting strength and deformation in the plastic range. Studies of industrial type frames. Current research. Comparison of conventional design methods with plastic design techniques.

ENCE 261. URBAN-REGIONAL CIVIL ENGINEERING PLANNING. (3)

First semester. Prerequisite, degree in Civil Engineering or consent of instructor. Theory and methodology for the synthesis of general civil engineering aspects of urban and regional planning. Integration of land use conditions and capabilities, population factors and needs, engineering economics and engineering technologies. Application to special problems in urban-regional development. Preparation of engineering reports. Presentation methods. (Piper.)

ENCE 262. CIVIL ENGINEERING PLANNING. (3)

Second semester. Prerequisite, ENCE 261 or equivalent. General to comprehensive planning of complex engineering facilities such as industrial plants, bridges, utilities and transportation projects. Planning based on the synthesis of all applicable factors. Emphasis on general civil engineering planning including site, structural and construction planning. Plan evaluation and feasibility. (Piper.)

ENCE 263. THEORY OF STRUCTURAL DESIGN. (3)

First semester. Prerequisite, ENCE 102, 103, 165, and 166 are equivalent. Advanced structural theory applied to the design of bridges and buildings. Methods of analysis for indeterminate structures, including moment distribution, Maxwell's method, virtual work, reciprocal theory, Muller Breslau's principle, and classical analytical methods. (Looney.)

ENCE 264. THEORY OF STRUCTURAL DESIGN. (3)

Second semester. Prerequisite, ENCE 263. Correlation of theory, experience, and experiments in study of structural behavior, proportioning, and preliminary design. Special design problems of fatigue, bucking, vibrations, and impact. (Looney.)

ENCE 265. BEHAVIOR OF STRUCTURES. (3)

First semester. Elastic behavior of structures and their components; flexure of beams; unsymmetrical bending, shear center, numerical methods; beams on elastic foundations, second order effects. General torsion of thin-walled open cross-sections. (Heins.)

ENCE 266. BEHAVIOR OF STRUCTURES. (3)

Second semester. Prerequisite ENCE 265. General torsion of thin-walled closed cross-sections. Differential equations of bending of beam columns; elastic, torsional and inelastic buckling of axially loaded columns; beams and beam columns; residual stresses, design. (Heins.)

ENCE 271. UNIT OPERATIONS OF ENVIRONMENTAL HEALTH ENGINEERING. (3)

First semester. Prerequisite, ENCE 106 or consent of instructor. Three lectures a week. Properties and quality criteria of drinking water as related to health are interpreted by a chemical and biological approach. Legal aspects of water use and handling are considered. Theory and application of aeration, sedimentation, filtration, centrifugation, desalinization, corrosion and corrosion control are among topics to be considered. (Cookson.)

ENCE 272. THEORY OF AQUEOUS AND SOLID WASTE TREATMENT AND DISPOSAL. (3)

Second semester. Prerequisites, ENCE 106 and fundamentals of microbiology, or consent of instructor. Three lectures a week. Theory and basic principles of treating and handling waste products; hydraulics of sewers; biological oxidation; principles and design criteria of biological and physical treatment processes; disposal of waste sludges and solids. (Cookson.)

ENCE 273. DESIGN OF WATER PURIFICATION FACILITIES. (3)

First semester. Corequisite, ENCE 271 or equivalent. Two lectures and two laboratory periods a week. Application of basic science and engineering science to design of water supply and purification processes; design and economics of unit operations as applied to environment systems. (Cookson.)

ENCE 274. DESIGN OF MUNICIPAL AND INDUSTRIAL WASTES TREATMENT FACILITIES. (3)

Second semester. Corequisite, ENCE 272 or equivalent. Two lectures and two laboratory periods a week. Application of basic science and engineering science

to design of municipal and industrial waste treatment processes; design and economics of unit operations as applied to environmental systems.

(Cookson)

ENCE 275. BIOLOGICAL PRINCIPLES OF ENVIRONMENTAL HEALTH ENGINEERING. (4)

First semester. Three lectures and one laboratory period a week. An exposition of biological principles directly affecting man and his environment; transmission of disease by water and air; assay, control and treatment of biological and virological agents in water, sewage, and air; microbiology and biochemistry of aerobic and anaerobic treatment processes for aqueous wastes.

(Cookson.)

ENCE 276. INDUSTRIAL WASTES. (3)

Second semester. Corequisite, ENCE 272, or equivalent. Three lectures a week. A study of the characteristics of liquid wastes from major industries, and the processes producing the wastes. The theory and methods of eliminating or treating the wastes, and their effects upon municipal sewage-treatment plants, and receiving waters.

(Cookson.)

ENCE 277. THE CHEMISTRY OF NATURAL WATERS. (4)

Second semester. Prerequisite, ENCE 176 or consent of instructor. Three lectures, one lab a week. Application of principles from chemical thermodynamics and kinetics to the study and interpretation of the chemical characteristics of natural water systems. The chemical composition of natural waters is rationalized by considering metal ion solubility controls, pH, carbonate equilibria, adsorption reactions, redox reactions, and the kinetics of oxygenation reactions which occur in natural water environments.

(Birkner.)

ENCE 278. APPLIED WATER CHEMISTRY. (4)

Second semester. Prerequisite, ENCE 277 or consent of instructor. Three lectures, one lab a week. A study of the chemistry of both municipal and industrial water treatment processes. Among the topics to be considered are water softening, stabilization, chemical destabilization of colloidal materials, ion exchange, disinfection, chemical oxidation and oxygenation reactions.

(Birkner.)

ENCE 279. AIR POLLUTION. (3)

Prerequisite, consent of instructor. Evaluation of the capacity of the atmosphere to assimilate the waste materials from an industrial society. The classification of pollutants and identification of specific emission sources will be considered together with the physiological effects of specific pollutants on plants, animals, and humans. Consideration will also be given to techniques and devices which have been devised for the sampling and control of particular emissions.

(Israel)

ENCE 280. AIR SAMPLING AND ANALYSIS. (3)

Prerequisite, ENCE 279 or consent of instructor. Two lectures and one laboratory a week. The theory and techniques utilized in the determination and measurement of chemical, radiological and biological pollutants in the atmosphere. Theory of particle deposition by diffusion, impaction, sedimentation and thermal and electrical forces, application to aerosol sampling with description of aerosol sampling devices and data evaluation.

(Israel)

ENCE 281. HIGHWAY TRAFFIC CHARACTERISTICS AND MEASUREMENTS. (3)

Prerequisite: ENCE 185 or consent of instructor. The study of the fundamental traits and behavior patterns of the road user and his vehicle in traffic. The basic characteristics of the pedestrian, the driver, the vehicle, traffic volume and speed, streamflow an intersection operation, parking, and accidents.

(Desrosiers)

ENCE 282. HIGHWAY TRAFFIC OPERATIONS. (3)

Prerequisite: ENCE 185, ENCE 281 or consent of instructor. A survey of traffic laws and ordinances. The design, application and operation of traffic control devices and aids, including traffic signs and signals, pavement markings, and hazard delineation. Capacity, accident, and parking analyses.

(Desrosiers.)

ENCE 285. RAIL TRANSPORTATION ENGINEERING. (3)

Prerequisite: ENCE 186 or consent of instructor. A study of the basic engineering components of conventional railroads, high speed railroads, and urban rail transit. The characteristics of the vehicle, the supporting way, and the terminal requirements will be evaluated with respect to system performance, capacity, cost, and level of service.

(Desrosiers.)

ENCE 286. AIRPORT PLANNING AND DESIGN. (3)

Prerequisite: ENCE 186 or consent of instructor. The planning and design of airports including site, selection, runway configuration, geometric and structural design of the landing area, and terminal facilities. Methods of financing airports, estimates of aeronautical demand, air traffic control, and airport lighting are also studied.

(Desrosiers.)

ENCE 287. HIGHWAY TRAFFIC FLOW THEORY. (3)

Prerequisite: ENCE 187, ENCE 188 or consent of the instructor. An examination of physical and statistical laws that are used to represent traffic flow phenomena. Deterministic models including heat flow, fluid flow, and energy-momentum analogies, car following models, and acceleration noise. Stochastic approaches using independent and Markov processes, queuing models, and probability distributions.

(Staff.)

ENCE 296, 297. ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3, 3)

First and second semesters. Three lectures each week. Prerequisite, consent of Head of Department. Applications to elasticity, stability and buckling, vibrations, thin plates and shells, or other problems in the area of mechanics, structures and materials.

(Schelling.)

ENCE 298. SEMINAR.

First or second semester. Credit in accordance with work outlined by the Department. Prerequisite, consent of the Department of Civil Engineering.

(Staff.)

ENCE 399. RESEARCH.

Credit in accordance with work done.

(Staff.)

ENCE 499. THESIS - RESEARCH.

Credit in accordance with work done.

(Staff.)

ELECTRICAL ENGINEERING

Professors: DE CLARIS, CHU, PRICE, RUTELLI, WAGNER AND WEISS.

Associate Professors: BASHAM, FERRIS, GINNINGS, HARGER, HOCHULI, MARCOVITZ, PUGSLEY, RAO, REISER, SIMONS AND TAYLOR.

Assistant Professors: ABRAMS, EMAD, FRIEDMAN, JESS, KIM, LEE, LEVINE, LIEBERMAN, SIAHATGAR, AND TRETTER.

Lecturers: BULLIS, DEGENFORD, LIN, MORAKIS, SCHULMAN AND WHICKER.

Instructors: COLBURN, GLOCK, GUHA, JONES, AND POTTALA.

ELECTRICAL ENGINEERING CURRICULUM

	Semester	
	I	II
SOPHOMORE YEAR		
MATH 021, 022—Analysis III, IV	4	4
PHY 031, 032—General Physics	4	4
ENES 021—Dynamics	3	..
ENES 080—Algorithmic Analysis and Computer Programming	2	..
ENES 083—Digital Computer Laboratory .....	..	1
ENEE 090—Circuit Analysis I .....	..	4
ENEE 091—Circuits Laboratory I .....	..	1
HLTH 005—Science and Theory of Health	(2)	..
General Education Courses	3	3
Total	16 or (18)	17
JUNIOR YEAR		
MATH 066—Differential Equations	3	..
ENME 100—Thermodynamics	3	..
PHYS 153—Modern Physics for Engrs. ....	..	3
ENEE 130, 132—Engineering Electromagnetics I, II	3	3
ENEE 120—Circuit Analysis II	4	..
ENEE 121—Circuits Laboratory II	1	..
ENEE 122—Electronic Circuits I .....	..	4
ENEE 123—Electronics Laboratory I .....	..	1
Technical Electives* .....	..	3
General Education Courses	3	3
Total	17	17
SENIOR YEAR		
ENEE 142—Engineering Probability	2	..
ENEE 134—Engineering Electromagnetics III	3	..
ENEE 140—Transducers and Electrical Machinery .....	..	3
ENEE 141—Transducers and Electrical Machinery Laboratory .....	..	1
ENEE 124—Electronic Circuits II	4	..
ENEE 125—Electronics Laboratory II	1	..
ENME 107—Energy Conversion .....	..	3
Technical Electives *	5	7
General Education Courses	3	3
Total	18	17

Technical electives available in Electrical Engineering are described in the course listings later in this catalog. Any course numbered between ENEE 150 and ENEE 199 (also ENEE 102) that is not specifically excluded in its

* Of the 15 technical elective credits, all of which must be of 100 level, at least 3 credits must be in electrical engineering and at least 3 credits must be either from other fields of engineering, mathematics, physics, or other suitable scientific discipline. The student's elective program must be approved by his advisor. More than 15 credits may be taken.

description may be used as part of a technical elective program. Approval by the student's faculty adviser of an in depth technical elective program is required.

For students planning to continue in graduate work, technical electives should be selected to provide the best possible preparation for the probable areas of graduate specialization. Broad areas in which opportunities for graduate specialization and research are particularly favorable in Electrical Engineering at Maryland at this time are as follows:

I. ELECTROPHYSICS AND ELECTROTECHNOLOGY

- a. Electromagnetic Theory and Applications
- b. Physical Electronics and Applications
- c. Quantum Electronics; Lasers and Nonlinear Optics
- d. Solid State Devices
- e. Charge Particle Dynamics

II. SYSTEM SCIENCES AND COMPUTERS

- a. Circuit, Network and System Theory
- b. Switching and Automata Theory and Design
- c. Computer Systems
- d. Coding Theory and Applications
- e. Information, Communication and Control Systems
- f. Simulation of Dynamic Systems

III. BIOMEDICAL ENGINEERING

- a. Electronic Instrumentation

For Undergraduate Credit

ENEE 050. FUNDAMENTALS OF ELECTRICAL ENGINEERING. (3)

Prerequisites, MATH 022, PHYS 032. Required of juniors in civil engineering. Not applicable for credit in the electrical engineering major program. Principles of electrical circuits, both steady state and transient; electric power; fundamentals of electronics for control and instrumentation.

ENEE 060, 062. PRINCIPLES OF ELECTRICAL ENGINEERING. (3, 3)

Prerequisites, MATH 022, PHYS 032. Corequisites, ENEE 061, 063. Required of aerospace, mechanical and (ENEE 060 only) chemical engineers. Not applicable in the electrical engineering major program. These courses are acceptable as prerequisites for some advanced ENEE courses. ENEE 060 includes analysis of linear systems; introduction to Laplace transforms; steady-state a-c transforms; introduction to the concepts of electromagnetic fields and electric machines. ENEE 062 includes principles and circuit applications of semiconductor devices and electron tubes.

ENEE 061, 063. ELECTRICAL ENGINEERING LABORATORY. (1, 1)

Two hours of laboratory per week. Corequisites, ENEE 060 (for ENEE 061) and ENEE 062 (for ENEE 063). Required of aerospace, mechanical, and ENEE 061 only) chemical engineers. Experiments on the transient and steady-state response of linear circuits, electric machines, and electron tubes and semiconductor devices.

ENEE 090. CIRCUIT ANALYSIS I. (4)

(See ENEE 091 for related laboratory course.) Corequisites, MATH 022, PHYS 032, ENEE 091. Required of sophomores in electrical engineering. Introduction to circuit theory; Ohm's law; Kirchhoff's laws; basic circuit analysis techniques; energy storage; power; elementary transients by classical and transform methods; sinusoidal analysis; introduction to complex frequency. ENEE 120 continues where ENEE 090 ends.

ENEE 091. CIRCUITS LABORATORY I. (1)

Two hours of laboratory per week. Corequisite, ENEE 090. Required of sophomores in electrical engineering. Laboratory to be taken in association with ENEE 090. Electrical components and basic test equipment; principles of measurement and data handling; circuit behavior with variation in component values.

*For Advanced Undergraduates and Graduates***ELECTROMAGNETICS AND PHYSICAL ELECTRONICS****ENEE 130, 132. ENGINEERING ELECTROMAGNETICS I, II (3, 3)**

Prerequisites, MATH 022, PHYS 032, ENEE 090, with an average grade of C or better in MATH 021, 022, PHYS 031, 032, and ENEE 090. Required of juniors in electrical engineering. Electric and magnetic fields, using vector notation; Maxwell's equations; Lorentz force law; capacitance, inductance, and resistance; motion of charged particles; fields in material media, polarization, magnetization; boundary value problems.

ENEE 134. ENGINEERING ELECTROMAGNETICS III. (3)

Prerequisite, ENEE 130. Required of seniors in electrical engineering. The wave equation and the impedance concept; plane waves; reflection and refraction, wave guides and transmission lines; Smith charts; lumped models.

ENEE 135. ELECTROMAGNETIC MEASUREMENT LABORATORY. (1)

Two hours of laboratory per week. Corequisite, ENEE 134. Laboratory to be taken in association with ENEE 134. Experiments on field mapping, transmission line matching, impedance measurement; microwave measurements of standing wave ratio, power, frequency, Q, and coupling.

ENEE 140. TRANSDUCERS AND ELECTRICAL MACHINERY. (3)

(See ENEE 141 for related laboratory course.) Prerequisite, ENEE 120, ENEE 132. Corequisite, ENEE 141. Required of seniors in electrical engineering. Electromechanical transducers; theory of electromechanical systems; power and wideband transformers; rotating electrical machinery from the theoretical and performance points of view.

ENEE 141. TRANSDUCERS AND ELECTRICAL MACHINERY LABORATORY. (1)

Two hours of laboratory per week. Corequisite, ENEE 140. Required of seniors in electrical engineering. Laboratory to be taken in association with ENEE 140. Experiments on transformers; synchronous machines; induction motors; synchros; loudspeakers; other transducers.

ENEE 170. ANTENNAS AND WAVE PROPAGATION. (3)

Corequisite, ENEE 134. Review of Maxwell's equations; radiation; antennas; radio wave propagation.

ENEE 182. INTRODUCTION TO SEMICONDUCTOR PHYSICAL ELECTRONICS. (3)

Prerequisites, ENEE 132 and PHYS 153, or equivalents. Basic properties of semiconductors; idealized p-n junction and transistor theory; d-c parameters; low-frequency characteristics; transistors as amplifiers and as switches; field effect transistors; integrated circuit considerations; other junction devices.

ENEE 184. PHYSICAL ELECTRONICS OF VACUUM AND GASEOUS DEVICES. (3)

Prerequisites, ENEE 132 and PHYS 153, or equivalents. Essential principles of quantum mechanics and quantum statistics; electron emission; electrons in electric and magnetic fields; space charge effects; vacuum tubes, electron beams; gas discharges and plasmas in electronic devices.

ENEE 186. PARTICLE ACCELERATORS, PHYSICAL AND ENGINEERING PRINCIPLES. (3)

Prerequisites, ENEE 132 and PHYS 153, or consent of the instructor. Sources of charged particles; methods of acceleration and focusing of ion beams in electromagnetic fields; basic theory, design, and engineering principles of particle accelerators.

CIRCUITS AND CONTROL SYSTEMS**ENEE 120. CIRCUIT ANALYSIS II. (4)**

(See ENEE 121 for related laboratory course.) Prerequisite, ENEE 090. Corequisites, ENEE 121, MATH 066. Required of juniors in electrical engineering. Continuation of ENEE 090. Complex frequency and frequency response application of both frequency-domain and time-domain concepts, mutual inductance and transformers; polyphase and time Fourier and Laplace transform methods; driving point and transfer functions; controlled sources.

ENEE 121. CIRCUIT LABORATORY II. (1)

Two hours of laboratory per week. Corequisite, ENEE 120. Required of juniors in electrical engineering. Laboratory to be taken in association with ENEE 120. Steady-state and transient circuit measurements; frequency response.

ENEE 122. ELECTRONIC CIRCUITS I. (4)

(See ENEE 123 for related laboratory course.) Prerequisite, ENEE 120. Corequisites, ENEE 123, and ENEE 130. Required of juniors in electrical engineering. Transistors and electron tubes in dc, pulse, and small-signal situations; analysis of basic amplifiers; biasing; basic electronic switches; tuned and wide-band amplifiers, feedback. ENEE 124 continues where ENEE 122 ends.

ENEE 123. ELECTRONICS LABORATORY I. (1)

Two hours of laboratory per week. Corequisite, ENEE 122. Required of juniors in electrical engineering. Laboratory to be taken in association with ENEE 122. Transistor and vacuum-tube characteristics; basic electronic switches, amplifiers; design practice. To the extent possible work will be individual or in two-man squads.

ENEE 124. ELECTRIC CIRCUITS II. (4)

(See ENEE 125 for related laboratory course.) Prerequisite, ENEE 122. Corequisites, ENEE 132, ENEE 123, and ENEE 125. Required of seniors in electrical engineering. Continuation of ENEE 122. Electron tubes and transistors in continuous-wave and public applications. Class C circuits; modulation and detection; pulse generation, delay, and storage; feedback amplifiers.

ENEE 125. ELECTRONICS LABORATORY II. (1)

Two hours of laboratory per week. Corequisite, ENEE 124. Required of seniors in electrical engineering. Laboratory to be taken in association with ENEE 124. Specification and design of electronic circuits. Students work as individuals or as responsible members of a project team.

ENEE 144. ELECTRONIC CIRCUITS. (3)

Prerequisite, ENEE 060 or equivalent knowledge of circuit theory or consent of the instructor. This course is intended for students in the Physical Sciences, and

for engineering students requiring additional study of electronic circuits. Credit not normally given for this course in an electrical engineering major program. (ENEE 123 or 125 may optionally be taken as an associated laboratory, as is appropriate.) P-n junctions; transistors; vacuum tubes; biasing and operating-point stability; switches; large-signal analysis; models; small-signal analysis; frequency response; feedback and multistage amplifiers; pulse and digital circuits.

ENEE 148. ELECTRONIC INSTRUMENTATION FOR PHYSICAL SCIENCE. (3)

Two hours of lecture and two hours of laboratory per week. Prerequisite, ENEE 060 or 120, PHYS 104 or equivalent, or consent of the instructor. The concept of instrumentation systems from sensor to readout; discussion of transducers; system dynamics, precision, and accuracy; measurement of electrical parameter; direct, differential, and potentiometric measurements; bridge measurements; time and frequency measurements; waveform generation and display.

ENEE 150. NETWORK SYNTHESIS. (3)

Prerequisite, ENEE 120. Positive real functions; synthesis of driving-point impedances; network functions, approximation methods; Chebyshev and Butterworth filters.

ENEE 154. FEEDBACK CONTROL SYSTEMS. (3)

Prerequisites, MATH 066 and ENEE 122. (See ENEE 155 for related laboratory course.) Feedback system operation and design; stability criteria; basic design techniques; correlation of time and frequency-domain concepts; flow-graph algebra; system synthesis to a variety of specifications.

ENEE 155. FEEDBACK CONTROL SYSTEM LABORATORY. (1)

Two hours of laboratory per week. Corequisite, ENEE 154. Projects to enhance the student's understanding of feedback control systems and familiarize him with some of the devices used in the control field.

ENEE 172. ADVANCED PULSE TECHNIQUES. (3)

(See ENEE 173 for related laboratory course.) Prerequisite, ENEE 124 or ENEE 144 or equivalent. Bistable, monostable, and astable circuits; sweep circuits; synchronization; counting; gates; comparators; magnetic core circuits; semiconductor and vacuum-tube circuits.

ENEE 173. PULSE TECHNIQUES LABORATORY. (1)

Two hours of laboratory per week. Corequisite, ENEE 172, or ENEE 164 and permission of the instructor. Experiments on switching circuits; bistable, monostable, and astable circuits; sweep circuits; gates; comparators.

ENEE 174. ADVANCED RADIO ENGINEERING. (3)

Corequisite, ENEE 124. (See ENEE 175 for related laboratory course.) The coupling coefficient concept; high-frequency effects; design and optimization of amplifiers; stability considerations; gain limitations; noise figure; design of harmonic generators; design of stable oscillators.

ENEE 175. ADVANCED RADIO ENGINEERING LABORATORY. (1)

Two hours of laboratory per week. Corequisite, ENEE 174. Experiments on multiple tuned amplifiers, noise figure measurements; class-C amplifiers; varactors; modulators. Projects.

ENEE 190. MATHEMATICAL FOUNDATIONS OF CIRCUIT THEORY. (3)

Prerequisites, ENEE 120 and MATH 022, or equivalent. Review of determinants; linear equations; matrix theory; eigen-values theory of complex variables; inverse Laplace transforms. Applications are drawn primarily from circuit analysis.

INFORMATION SCIENCES AND COMPUTERS

ENEE 102. INTRODUCTION TO DISCRETE STRUCTURES. (3)

This is the same course as CMSC 102. Prerequisite, ENEE 080 or equivalent. Review of set algebra including relations, partial orderings and mappings. Algebraic structures including semigroups and groups. Graph Theory including trees and weighted graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computer engineering and computer science.

ENEE 142. ENGINEERING PROBABILITY. (2)

Prerequisites, MATH 022 and ENEE 090. Required of electrical engineering majors. Probability theory, discrete and continuous; statistical distribution functions and their parameters; applications to electrical engineering.

ENEE 158. SIGNAL ANALYSIS, MODULATION, AND NOISE. (3)

Prerequisites, ENEE 122 and ENEE 142. Signal transmission through networks; transmission in the presence of noise; statistical methods of determining error and transmission effects; modulation schemes.

ENEE 160. ANALOG AND HYBRID COMPUTERS. (3)

Prerequisites, ENEE 062 or 122 or 144 or equivalent and MATH 066 or equivalent. Programming the analog computer; analog computing components; error analysis; repetitive operations; synthesis of systems using the computer; hybrid computer systems.

ENEE 162. LOGIC OF DIGITAL COMPUTERS. (3)

Three hours of lecture per week. Prerequisites, MATH 021, ENEE 080, or equivalent. Symbolic logic and Boolean algebra; switching circuits; simplification; binary logic; basic sequential circuits; digital systems.

ENEE 163. DIGITAL LOGIC LABORATORY. (1)

Two hours of laboratory per week. Prerequisite, ENEE 162 or equivalent. Design, breadboard construction and checkout of simple digital systems such as counters, shift registers, arithmetic and control units.

ENEE 164. DIGITAL COMPUTER TECHNOLOGY. (3)

(See ENEE 173 for related laboratory.) Prerequisites, ENEE 062 or 122 or 144, and ENEE 162. Organization of electronic digital computers; electronic sub-assemblies; integrated digital storage; digital and analog magnetic recording; analog-digital conversion.

ENEE 166. FUNCTIONAL ORGANIZATION OF DIGITAL COMPUTER SYSTEM. (3)

This is the same course as CMSC 166. Prerequisite, ENEE 162, or CMSC 100, or equivalent. Computer organization and configuration; interconnection of sub-units into a computer system; arithmetic logic; storage structure and logic; control and sequencing; input-output systems. A small computer and a modern large-scale computer system will be used to illustrate these concepts. Each student will be expected to complete a project.

BIO-MEDICAL ENGINEERING

ENEE 146. ELECTRONICS FOR LIFE SCIENTISTS. (4)

Three hours of lecture and two hours of laboratory per week. Prerequisites, college algebra and a physics course, including basic electricity and magnetism. Not accepted for credit in an electrical engineering major program. The concept of an instrumentation system with emphasis upon requirements for transducers, am-

plifiers, and recording devices, design criteria and circuitry of power supplies, amplifiers, and pulse equipment; specific instruments used for biological research; problems of shielding against hum and noise pickup and other interference problems characteristic of biological systems.

SPECIAL TOPICS

ENEE 180. TOPIC IN ELECTRICAL ENGINEERING. (3)

Prerequisite, permission of the instructor. May be taken for repeated credit up to a total of 6 credits, with the permission of the student's advisor and the instructor. Selected topics from the literature of modern electrical engineering.

ENEE 181. PROJECTS IN ELECTRICAL ENGINEERING. (1-3)

Hours to be arranged. Prerequisites, senior standing and permission of the instructor. May be taken for repeated credit up to a total of 4 credits, with the permission of the student's advisor and the instructor. Theoretical and experimental projects.

For Graduates

ELECTROPHYSICS AND ELECTROTECHNOLOGY

ENEE 201. ELECTROMAGNETIC THEORY. (3)

Prerequisite, ENEE 134 or 170 or 215, or equivalent. Theoretical analysis and engineering applications of Laplace's, Poisson's and Maxwell's equations.

ENEE 206, 207. MICROWAVE ENGINEERING. (3,3)

Prerequisite, ENEE 201 or ENEE 216. Basic considerations in solving field problems using differential equations; circuit concepts and their validity at high frequency; guided electromagnetic waves; principles of masers and lasers; propagation and diffraction, including the optical region. Fundamental experiments at microwave and optical frequencies.

ENEE 215, 216. RADIO WAVE PROPAGATION. (3,3)

Prerequisite, undergraduate degree in electrical engineering, physics, or mathematics. Maxwell's wave equation; concept of retarded magnetic vector potential; propagation over plane earth; propagation over spherical earth; refraction; meteorological effects; complex antennas; air-air propagation; lobe modulation.

ENEE 250. MATHEMATICS FOR ELECTROMAGNETISM. (3)

Prerequisite, undergraduate preparation in electromagnetic theory and advanced calculus. Tensors and curvilinear coordinates; partial differential equations of electrostatics and electrodynamics; functionals, integral equations, and calculus of variations as applied to electromagnetism.

ENEE 251. ANTENNA THEORY. (3)

Prerequisite, ENEE 250 or equivalent. Review of Maxwell's equations; radiative networks; linear antennas; antenna arrays; aperture antennas; slot antennas; advanced topics.

ENEE 280. ELECTRONIC PROPERTIES OF SEMICONDUCTORS. (3)

Prerequisites, ENEE 182, or MATH 066 and PHYS 153, or equivalents. Properties of crystals; elementary topics from quantum mechanics; energy bands; electron transport theory; conductivity and Hall effect; statistical distributions; Fermi Level; impurities; non-equilibrium carrier distributions; normal modes of vibration; effects of high electric fields; p-n junction theory, avalanche breakdown; tunneling phenomena; surface properties.

ENEE 282. TECHNOLOGY OF SEMICONDUCTOR DEVICES AND MATERIALS. (3)

Prerequisites, ENEE 182 or PHYS 153 or ENEE 280. Basic processes involved in the fabrication of transistors and other semiconductor devices; crystal growth and epitaxy; crystal orientation; purification and doping of crystals; diffusion; electrical and optical properties; photo-resist techniques; oxide passivation; contacts; device assembly and packaging. Emphasis is on silicon but other materials of engineering significance are considered.

ENEE 290. CHARGED PARTICLE DYNAMICS, ELECTRON AND ION BEAMS. (3)

Prerequisite, consent of the instructor. General principles of single-particle dynamics; mapping of electric and magnetic fields; equation of motion and methods of solution; production and control of charged particle beams; electron optics; Liouville's theorem; space charge effects in high current beams; design principles of special electron and ion beam devices.

SYSTEM SCIENCES AND COMPUTERS**ENEE 202, 203. TRANSIENTS IN LINEAR SYSTEMS. (3, 3)**

Prerequisite, undergraduate major in electrical or mechanical engineering or physics. Operational circuit analysis; the Fourier integral; transient analysis of electrical and mechanical systems and electronic circuits by the Laplace transform method.

ENEE 204. ADVANCED ELECTRONIC CIRCUIT DESIGN. (3)

Prerequisites, ENEE 124 or consent of the instructor. Comparison of bipolar and field effect transistors; detailed frequency response of single and multistage amplifiers; design of feedback amplifiers; d-c coupling techniques; design of multistage tuned amplifiers.

ENEE 212, 213. SERVOMECHANISMS. (3, 3)

Prerequisites, ENEE 154 and ENEE 202, or equivalent. Linear control systems with deterministic and stochastic inputs; non-linear control systems; time and frequency-domain techniques.

ENEE 218, 219. SIGNAL ANALYSIS AND NOISE. (3)

Prerequisite, equivalent to ENEE 158. Mathematical description of noise spectral analysis; noisy signal detection; optimum linear systems.

ENEE 220. STATISTICAL COMMUNICATION THEORY. (3)

Prerequisite, ENEE 219. Statistical description of signals; testing statistical hypotheses; likelihood testing; statistical estimation of signal parameters.

ENEE 221. INFORMATION THEORY. (3)

Prerequisite, STAT 100 or equivalent. Information measure; channels; source encoding; error-correcting codes.

ENNE 230. MATHEMATICS OF CIRCUIT ANALYSIS. (3)

Prerequisite, undergraduate circuit theory and advanced calculus. Determinants; linear equations; matrix theory; eigenvalues; theory of complex variables; inverse Laplace transforms; applications to circuit analysis.

ENEE 231. ACTIVE NETWORK ANALYSIS. (3)

Prerequisite, ENEE 190 or equivalent. The complex frequency plane; conventional feedback amplifier theory; mathematical definitions of feedback and sensitivity; theorems for feedback circuits; stability and physical realizability of electrical networks; Nyquists and Routh's criteria for stability; activity and passivity criteria.

ENEE 232, 233. NETWORK SYNTHESIS. (3)

Prerequisite, ENEE 234 or equivalent. Design of driving-point and transfer impedance functions with emphasis of the transfer loss and phase of minimum-phase networks; flow diagrams; physical network characteristics, including relations existing between the real and imaginary components of network functions; modern methods of network synthesis.

ENEE 234. GRAPH THEORY IN NETWORK ANALYSIS. (3)

Prerequisite, ENEE 230. Linear graph theory as applied to electrical networks; cut sets and tie sets; incidence matrices; trees, branches, and mazes, development of network equations by matrix and index notation; network characteristic equations for natural circuit behavior; signalflow-graph theory and Mason's rule; stability of active two-port networks.

ENEE 235: APPLICATION OF TENSOR ANALYSIS. (3)

Prerequisite, ENEE 202 or ENEE 230. The mathematical background of tensor notation which is applicable to electrical engineering problems. Applications of tensor analysis to electric-circuit theory and to field theory.

ENEE 238. SAMPLED-DATA CONTROL SYSTEMS. (3)

Prerequisite, undergraduate or graduate preparation in linear feedback control theory. Z-transform and modified Z-transform method of analysis; root-locus and frequency-response methods of analysis; discrete and continuous compensation; analysis with finite pulse width; digital control systems.

ENEE 260. THEORY OF CODING. (3)

Prerequisite, ENEE 102 or equivalent knowledge of modern algebra and logic of switching systems. Introduction to coding and brief review of modern algebra; theory of linear codes; decoding; Hamming, cyclic, and Bose-Chaudhuri codes. Error-checking codes for arithmetic; $A_n + B$ type codes; residue checks. Practical self-checking arithmetic units; simple automatic fault diagnosing techniques.

ENEE 262. COMBINATORIAL SWITCHING THEORY. (3)

Prerequisites, ENEE 102 and ENEE 162. Application of algebraic techniques to combinatorial switching networks. Symmetric functions, majority and threshold networks; function decomposition; prime implicant algorithms; minimal and nearby minimal covers.

ENEE 263. THEORY OF SEQUENTIAL MACHINES. (3)

This is the same course as CMSC 263. Prerequisites, ENEE 102, and CMSC 100 or ENEE 162. Definition and representation of finite automata and sequential machines, equivalence of states and machines, congruence and reduced machines, analysis and synthesis of machines, decision problems of finite automata, partitions and the substitution property, generalized and incomplete machines, semigroups and machines, and other selected topics.

ENEE 270. DIGITAL COMPUTER DESIGN. (3)

Prerequisite, ENEE 166 or equivalent. Introduction to design techniques for digital computers; review of Boolean algebra; digital arithmetic; logic circuits; digital memories; design of computer elements, arithmetic unit, and control unit. A simple digital computer will actually be designed during the course.

ENEE 272. ADVANCED DIGITAL COMPUTER DESIGN. (3)

Prerequisites, ENEE 270 or equivalent; knowledge of computer programming. Computer design languages; computer organization; computer design by language translation; integrated logic circuit design; digital memories including read-only and associative memories; case studies of computer designs.

ENEE 274. DIGITAL SYSTEMS ENGINEERING. (3)

Prerequisite, ENEE 270. Systems aspects of digital-computer-based systems; data-flow analysis; system organization; control languages; consoles and displays; remote terminals; software-hardware tradeoff; system evaluation; case studies from selected applications areas such as data acquisition and reduction, information storage, or the like.

ENEE 276. COMPUTERS FOR DIFFERENTIAL EQUATION SOLUTION. (3)

Prerequisite, ENEE 162, knowledge of elementary differential equations, numerical methods, and programming. Mechanistic methods for differential equation solution; application of analog or hybrid computers for the purpose; digital differential analyzers; digital-analog simulation on a general-purpose digital computer; MIMIC Language and examples of its use. Class will run simulation program on an IBM 7094 or similar computer.

ENEE 284. SEMICONDUCTOR DEVICE MODELS. (3)

Prerequisite, ENEE 182 and ENEE 234, or equivalents. Single-frequency models for transistors; small-signal and wide-band models for general non-reciprocal devices; hybrid- π and tee models for transistors; relationship of models to transistor physics; synthesis of wide-band models from terminal behavior; computer utilization of models; models for other semiconductor devices.

ENEE 399 are required of M.S. degree candidates and a minimum of eighteen semester hours are required of Ph.D. candidates. A thesis covering an approved research problem and written in conformity with the regulations of the Graduate School is a partial requirement for either the degree of Master of Science or the degree of Doctor of Philosophy in electrical engineering.

BIO-MEDICAL ENGINEERING**ENEE 245. ELECTRICAL TECHNIQUES IN MEDICINE AND BIOLOGY. (3)**

Prerequisite, mathematics through differential equations and physics through electricity and magnetism, or equivalent. Electrical properties of biological tissues and cell suspensions; alternating-current impedance spectroscopy; transducers and related instrumentation systems for biological measurements; biological control systems; interaction of electromagnetic fields with biological systems. Special topics in Bio-Medical Engineering are presented under the seminar course ENEE 222 and the advanced topics course ENEE 223.

SPECIAL TOPICS AND RESEARCH**ENEE 222. GRADUATE SEMINAR. (1-3)**

Prerequisite, consent of instructor. Seminars are held on topics such as microwave engineering, radiation engineering, non-linear circuit analysis, modern control theory, artificial intelligence, and other topics of current interest. May be taken for repeated credit.

ENEE 223. ADVANCED TOPICS IN ELECTRICAL ENGINEERING. (3)

Prerequisite, permission of the instructor. Selected topics from the current literature of electrical engineering. May be taken for repeated credit.

ENEE 399. ELECTRICAL ENGINEERING RESEARCH.

Prerequisite, consent of thesis supervisor. Six semester hours of credit in

COMPUTER SYSTEM ENGINEERING

This Master of Science degree program is sponsored jointly by the Electrical Engineering Department and the Computer Science Center. It is designed to provide an integrated education in computer systems, balanced between hardware and software. Courses in the program are offered by the sponsoring bodies. Undergraduate students planning to enter this graduate program should consult an advisor for proper elective selection.

ENGINEERING SCIENCES

ENES 001. INTRODUCTORY ENGINEERING SCIENCE. (3)

One lecture and two laboratory periods a week. Prerequisite, concurrent registration in MATH 019 (or approval by department head). Basic "languages" of the engineer. Elements of graphic communication and analysis. Orthographic projection and descriptive geometry; conventions; graphs and curve-fitting. Vectors as tools of communication and analysis. Applications to geometry of engineering problems. (Elkins, Puckett and Staff)

ENES 010. MECHANICS. (3)

Three lectures and two drill periods a week. Prerequisites, ENES 001 and concurrent registration in MATH 020 (or approval of department head). Systems of rigid bodies in equilibrium under action of forces and couples. Numerical, graphical, and vectorial computation applied to problems in statistics and elementary dynamics. (Elkins, Puckett and Staff)

ENES 020. MECHANICS OF MATERIALS. (3)

Three lectures a week. Prerequisites, MATH 020, PHYS 030, and ENES 010 (or concurrent registration in MATH 021 and PHYS 031). Distortion of engineering materials in relation to changes in stress or temperature. Geometry of internal strain and external displacement. Application to beams, columns, shafts, tanks, and other structural, machine and vehicle members. (Lepper and Staff)

ENES 021. DYNAMICS. (3)

Three lectures a week. Prerequisites, ENES 010; concurrent registration in MATH 021 and PHYS 031 (with which subject matter is coordinate and applied to engineering problems). Systems of heavy particles and rigid bodies at rest and in motion. Force-acceleration, work-energy, and impulse-momentum relationships. Motion of one body relative to another in a plane and in space. (Hayleck and Staff)

ENES 030. MATERIALS SCIENCE. (3)

Three lectures a week. Prerequisite, ENES 020. Basic principles, nature, and properties of engineering materials. Structure of matter, phase transformations and mechanical properties of metals, ceramics, polymers and related materials; electrical, thermal and magnetic properties, corrosion and radiation damage, friction and wear, diffusion. (Asimow and Staff)

ENES 080. ALGORITHMIC ANALYSIS AND COMPUTER PROGRAMMING. (2)

One hour of lecture and two hours of laboratory per week. Corequisite, MATH 021. Required of sophomores in electrical engineering. Concept and properties of algorithms (fully defined procedures for solving problems); problems from numerical mathematics; use of a specific algorithmic language (MAD); completion of several projects using a digital computer. (Abrams and Staff)

ENES 083. DIGITAL COMPUTER LABORATORY. (1)

Two hours of laboratory per week. Prerequisite, ENES 080. Required of sophomores in electrical engineering. Completion of several projects in numerical mathematics on a digital computer, with emphasis on efficiency of computation, accuracy of approximations, and control of errors. (Rao and Staff.)

FIRE PROTECTION ENGINEERING

Professor: BRYAN.

Assistant Professor: HICKEY.

Lecturer: CUSTER.

FIRE PROTECTION CURRICULUM

	Semester	
	I	II
SOPHOMORE YEAR		
MATH 021, 022—Analysis III, IV	4	4
PHYS 031, 032—General Physics	4	4
ENES 020—Mechanics of Materials	3	..
ENES 021—Dynamics .....	..	3
HLTH 005—Science and Theory of Health	(2)	..
ENFP 080—Fire Protection Org.	3	..
ENFP 090—Essentials of Fire Prot. ....	..	3
General Education Courses	3	3
Total	17 or (19)	17
JUNIOR YEAR		
General Education Courses	3	3
ENEE 050—Fundamentals of Elec. Engr. ....	..	3
ENES 030—Materials Science or .....	..	..
ENCE 050—Fundamentals of Engineering Materials	3	..
ENCE 112—Applied Math in Engr. or .....	..	..
MATH 066—Differential Equations	3	..
ENCE 105—Fluid Mechanics .....	..	3
ENFP 110—Installations and Equipment	3	..
ENFP 112—Fire Prot. Fluids and Systems .....	..	3
ENFP 115—Water Suppression Systems .....	..	3
ENFP 120—Construction Fundamentals and Ins. Schedules	3	..
Approved Electives	2-3	2-3
Total	17-18	17-18
SENIOR YEAR		
General Education Courses	3	3
ENME 100—Thermodynamics	3	..
ENCE 100—Engineering Analysis and Computer Programming	3	..
BA 191—Property Insurance .....	..	3
ENCH 142—Environmental Consideration of Nuclear Engineering .....	..	3
ENFP 111—Process and Transportation Hazards .....	..	3
ENFP 114—Fire Analysis	3	..
ENFP 116—Problem Synthesis and Design	3	..
ENFP 117—Technical Projects .....	..	3
Approved Technical Electives	3	3
Total	18	18

ENFP 080. FIRE PROTECTION ORGANIZATION. (3)

First semester. Two lectures and one laboratory period a week. Fire loss records and the economics aspects of fire costs. Organization and administration of municipal and industrial fire protection. (Application of evaluation techniques to fire protection organizations.)

ENFP 090. ESSENTIALS OF FIRE PROTECTION. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite, ENFP 080. Chemistry of combustion and analysis of the properties of materials affecting fire behavior. Detailed examination of the basic fire phenomenon.

ENFP 110. INSTALLATIONS AND EQUIPMENT. (3)

First semester. Two lectures and one laboratory period a week. Prerequisites, ENFP 090 and junior standing. The design and installation of gaseous and solid particle suppression systems. Design standards and specifications for installation of detection, signalling and communication systems. The principles of suppression theory applied to laboratory problems.

ENFP 111. PROCESS AND TRANSPORTATION HAZARDS. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite, ENFP 110. Special hazards of industrial processing and manufacturing, the transportation of personnel and products. Analytical approach to hazard evaluation and control. Variable affecting control design in relation to probability, reliability, economic, legal, and psychological factors.

ENFP 112. FIRE PROTECTION FLUIDS AND SYSTEMS. (3)

Second semester. Two lectures and one laboratory period a week. Corequisite ENFP 115. Fluids utilized in fire suppression systems and operations. Laboratory study of operational and hydraulic problems. (Design of water supply and distribution for fire protection.)

ENFP 114. FIRE ANALYSIS. (3)

First semester. Two lectures and one laboratory period a week. Prerequisite ENFP 112. The mass fire problem, with consideration of conflagrations and fire storms; thermal, structural, environmental, meteorological factors; techniques of prediction and continuity analysis.

ENFP 115. WATER SUPPRESSION SYSTEMS. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite ENFP 110. Corequisite FP 112. The design and installation automatic sprinkler, water spray systems. Computation of water flow, pressure, and system loss characteristics. Development of hydraulically balanced flow characteristics. Laboratory sessions on design and evaluation procedures.

ENFP 116. PROBLEM SYNTHESIS AND DESIGN. (3)

First semester. Two lectures and one laboratory period a week. Prerequisite senior standing. Techniques and procedures of problem orientation and solution design utilizing logical and numerical procedures. Fundamentals of a systems approach. Study of historical, current, and future problems. Probability statistics as applied to fire protection problems.

ENFP 117. TECHNICAL PROJECTS. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisite ENFP 116. An examination of the specialized areas of fire protection and the state of the research in these areas. Student development and discussion of research projects in a selected area.

ENFP 120. CONSTRUCTION FUNDAMENTALS AND INSURANCE SCHEDULES. (3)

First semester. Two lectures and one laboratory period a week. Prerequisite ENFP 080. A study of the insurance rating schedules and their principles of application. Functional and structural aspects of construction affected by the variables of fire environment. The examination of specific laws, codes, and ordinances. Laboratory examination of fire test procedures.

MECHANICAL ENGINEERING

Professors: SHREEVE, JACKSON, R. W. ALLEN, ARMSTRONG, HSU, MARCINKOWSKI, SAYRE, TALAAT, WESKE.

Associate Professors: ANAND, HAYLECK, WOCKENFUSS, ASIMOW, BERGER, CUNNIFF, JOHN, MARKS, WALSTON, YANG.

Assistant Professors: BUCKLEY, ELKINS, FOURNEY, MORSE, SALLET, TODESCHINI, TSUI.

Instructors: BECKER, BROWNE, KRAFT, KISIELEWSKI, MORIN, OWENS, PUCKETT, ALIC, FISHER, HAWKS, KAUFFMANN, MAHAJAN, NORTH, ROOT.

Lecturers: SEIGEL, HABERMAN, DAWSON.

MECHANICAL ENGINEERING CURRICULUM

SOPHOMORE YEAR

	Semester	
	I	II
MATH 021, 022—Analysis III, IV	4	4
PHYS 031, 032—General Physics	4	4
ENES 020—Mechanics of Materials	3	..
ENES 021—Dynamics .....	..	3
ENME 060—Thermodynamics .....	..	3
HLTH 005—Science and Theory of Health	(2)	..
General Education Courses	3	3
ENME 015	2	..
Total	16 or (18)	17

JUNIOR YEAR

General Education Courses	3	3
ENEE 060, 062—Principles of Electrical Engineering	3	3
ENEE 061, 063—Electrical Engr. Lab.	1	1
ENES 030—Materials Science	3	..
ENME 101—Dynamics of Machinery	2	..
ENME 102—Fluid Mechanics I	3	..
ENME 103—Materials Engineering .....	..	3
ENME 104—Gas Dynamics .....	..	3
ENME 106—Transfer Processes .....	..	3
ENME 120—Measurements Laboratory .....	..	2
ENME 116—Applied Mathematics in Engineering	3	..
Total	18	18

SENIOR YEAR

General Education Courses	3	3
ENME 150, 151—Energy Conversion	4	3
ENME 152—Machine Design	3	..
ENME 154, 155—Engineering Experimentation	2	2
ENME 156, 157—Mechanical Engineering Analysis and Design	3	4
Technical Elective	3	6
Total	18	18

TECHNICAL ELECTIVES

ENME 140—Engineering Analysis and Computer Programming	3
ENME 153—Elasticity and Plasticity I	3
ENME 162—Dynamics II	3
ENME 164—Thermodynamics II	3
ENME 166—Special Problems	3
ENME 161—Environmental Engineering	3
ENME 163—Fluid Mechanics II	3
ENME 165—Automatic Controls	3
ENME 167—Introduction to Operations Research I	3
ENME 170—Structure and Properties of Engineering Materials	3
ENME 171—Physical Chemistry of Engineering Materials ..	3
ENME 172—Technology of Engineering Materials	3
ENME 173—Processing of Engineering Materials	3

For Undergraduates

ENME 050. PRINCIPLES OF MECHANICAL ENGINEERING. (3)

Three lectures a week. Prerequisites, PHYS 032, MATH 021. Required of Civil Engineers. Laws and corollaries of classical thermodynamics. Properties and characteristics of pure substances and perfect gases. Vapor and gas cycles. Mixture of gases including applications to psychrometry. Introduction to heat transfer.

ENME 060. THERMODYNAMICS I. (3)

Two lectures and one laboratory period a week. Prerequisites, PHYS 031, MATH 021 concurrently. Required of sophomores in mechanical and aeronautical engineering. Properties, characteristics, and fundamental equation of gases, and vapors. Application of first and second laws of thermodynamics in the analysis of basic heat engines, air compression, and vapor cycles. Flow and non-flow processes for gases and vapors. (Allen and Staff)

For Advanced Undergraduates and Graduates

ENME 100. THERMODYNAMICS. (3)

Two lectures and one laboratory period a week. Prerequisites, PHYS 031, MATH 021. The properties, characteristics, and fundamental equations of gases, and vapors. Application of the first and second laws of thermodynamics in the analysis of basic heat engines, air compression, and vapor cycles. Flow and non-flow processes for gasses and vapors. (Morse, Allen)

ENME 101. DYNAMICS OF MACHINERY. (2)

One lecture and one laboratory period a week. Prerequisites, ENES 021; ME 116 concurrently. Dynamic characteristics of machinery with emphasis on systems with single degree of freedom. (Hayleck, Cuniff)

ENME 102. FLUID MECHANICS I. (3)

Two lectures and one laboratory period a week. Prerequisite, ENME 060. A rational study of fluids at rest and in motion. Principles of viscous and turbulent flow in pipes, nozzles, etc. Impulse and momentum. Pumps, turbines, and meters. Dimensional analysis and laws of similarity. (Sayre, John)

ENME 103. MATERIALS ENGINEERING. (3)

Two lectures and one laboratory period a week. Prerequisite, ES 030. Processes and methods to manufacture and usefully apply engineering materials; alloys and heat treatment of steel; strengthening processes for ferrous and non-ferrous alloys. Fabrication techniques for metals, polymers, and refractories. Specification, inspection, control and automation. (Armstrong)

ENME 104. GAS DYNAMICS. (3)

Two lectures and one laboratory period a week. Prerequisite, ENME 102. Compressible flow in ducts and nozzles; effect of area change, heat addition, friction, and normal shocks. Thermodynamics of chemically reacting flows, combustion and equilibrium. (Sallet, John)

ENME 106. TRANSFER PROCESSES. (3)

Three lectures a week. Prerequisite, ENME 102. Conduction by steady state and variable heat flow; laminar and turbulent flow; free and forced convection; radiation, evaporation and condensation of vapors. Transfer of mass, heat, and momentum. (Allen, Hsu)

ENME 107. ENERGY CONVERSION. (3)

Three lectures a week. Prerequisite, ENME 100. Required of seniors in electrical engineering. Chemical, heat, mechanical, nuclear and electrical energy conversion processes, cycles and systems. Direct conversion processes of fuel cells, thermionics, and magnetohydropower. (Kraft, John, Owens)

ENME 116. APPLIED MATHEMATICS IN ENGINEERING. (3)

Prerequisite, MATH 021. Mathematical techniques applied to the analysis and solution of engineering problems. Use of differentiation, integration, differential equations, partial differential equations and integral transforms. Application of infinite series, numerical and statistical methods. (Yang, Walston)

ENME 120. MEASUREMENTS LABORATORY. (2)

One lecture and one laboratory period a week. Prerequisites, ENES 030, ENME 101, and ENEE 060, ENME 106 concurrently. Required of juniors in Mechanical Engineering. Measurements and measurement systems; applications of selected instruments with emphasis on interpretation of results. (Tsui, North.)

ENME 140. ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)

Three lectures a week. Prerequisite, ENME 116. Elements of operational calculus, vector analysis; numerical methods and programming for computers. Errors, interpolation, series, integration, iteration and solution of equations. (Sayre, Cunniff)

ENME 150, 151. ENERGY CONVERSION. (4, 3)

First semester. Three lectures, one laboratory a week. Second semester. Two lectures, one laboratory a week. Prerequisites, ENME 104, ENME 106. Chemical, heat, mechanical, nuclear and electrical energy conversion processes, cycles and systems. Reciprocating, turbo- and jet-propulsion power plants and components using all types of heat and reaction sources. Direct conversion processes of fuel cells, thermionics and magnetohydropower. (Shreeve, Allen, Talaat)

ENME 152. MACHINE DESIGN. (3)

Two lectures and one laboratory period a week. Prerequisites, ENME 101, 103. Working stresses, stress concentration, stress analysis and repeated loadings. Design of machine elements. Kinematics of mechanisms. (Hayleck, Jackson)

ENME 153. ELASTICITY AND PLASTICITY I. (3)

Three lectures a week. Prerequisite, ENME 152. Analysis of plates and shells, thick walled cylinders, columns, torsion of non-circular sections, and rotating disks. (Berger, Todeschini.)

ENME 154, 155. ENGINEERING EXPERIMENTATION. (2, 2)

One lecture and one laboratory period a week. Prerequisite, senior standing in Mechanical Engineering. Theory of experimentation. Selected experiments emphasize planned procedure, analysis and communications of results, analogous systems and leadership. (Allen, Anand)

ENME 156, 157. MECHANICAL ENGINEERING ANALYSIS AND DESIGN. (3, 4)

First semester, two lectures, one laboratory period per week; second semester, two lectures and two laboratory periods per week. Prerequisite, senior standing in Mechanical Engineering. Creative engineering and problem analysis. Systems design including control, reliability and manufacturing requirements. Use of computers in design. Design of multi-variable systems.

(Berger, Sayre, Walston)

ENME 161. ENVIRONMENTAL ENGINEERING. (3)

Three lectures a week. Prerequisites, ENME 101, 106, senior standing in Mechanical Engineering. Heating and cooling load computations. Thermodynamics of refrigeration systems. Low temperature refrigeration. Problems involving extremes of temperature, pressure, acceleration and radiation.

(North)

ENME 162. DYNAMICS II. (3)

Three lectures a week. Prerequisites, ENME 101, ENME 116, senior standing in Mechanical Engineering. Linear and non-linear plane and three-dimensional motion, moving axes, Lagrange's equation, Hamilton's principle, non-linear vibration, gyroscope, celestial mechanics.

(Hayleck, Cunniff)

ENME 163. FLUID MECHANICS II. (3)

Three lectures a week. Prerequisites, ENME 104, ENME 106, senior standing. Hydrodynamics with engineering applications. Stream function and velocity potential; conformal transformations; pressure distributions; circulation; numerical methods and analogies.

(Buckley, Sayre)

ENME 164. THERMODYNAMICS II. (3)

Three lectures a week. Prerequisites, ENME 104, ENME 106, senior standing. Applications to special systems, change of phase, low temperature. Statistical concepts, equilibrium, heterogenous systems.

(Shreeve, Allen)

ENME 165. AUTOMATIC CONTROLS. (3)

Three lectures per week. Prerequisites, ENEE 062, senior standing. Hydraulic, electrical, mechanical and pneumatic automatic control systems. Open and closed loops. Steady state and transient operation, stability criteria, linear and non-linear systems. Laplace transforms.

(Anand, Yang)

ENME 166. SPECIAL PROBLEMS. (3)

Three lectures a week. Prerequisite, senior standing in Mechanical Engineering. Advanced problems in mechanical engineering with special emphasis on mathematical and experimental methods.

(Staff)

ENME 167. OPERATIONS RESEARCH I. (3)

Three lectures a week. Prerequisite, senior standing in Mechanical Engineering. Applications of linear programming, queuing model, theory of games and competitive models to engineering problems.

(Jackson)

ENME 170. STRUCTURE AND PROPERTIES OF ENGINEERING MATERIALS. (3)

A comprehensive survey of the atomic and electronic structure of solids with emphasis on the relationship of structure to the physical and mechanical properties.
(Armstrong, Asimow)

ENME 171. PHYSICAL CHEMISTRY OF ENGINEERING MATERIALS. (3)

Equilibrium multicomponent systems and relationship to the phase diagram. Thermodynamics of polycrystalline and polyphase materials. Diffusion in solids, kinetics of reactions in solids.
(Armstrong, Asimow)

ENME 172. TECHNOLOGY OF ENGINEERING MATERIALS. (3)

Relationship of properties of solids to their engineering applications. Criteria for the choice of materials for electronic, mechanical and chemical properties. Particular emphasis on the relationships between structure of the solid and its potential engineering application.
(Armstrong, Asimow)

ENME 173. PROCESSING OF ENGINEERING MATERIALS. (3)

The effect of processing on the structure of engineering materials. Processes considered include refining, melting and solidification, purification by zone refining, vapor phase processing, mechanical working and heat treatments.
(Armstrong, Asimow)

*For Graduates***ENME 200. INTERMEDIATE DYNAMICS. (3)**

Prerequisite, ENME 157. Fundamentals of Newtonian dynamics which includes kinematics of a particle, dynamics of a particle and a system of particles, Hamilton's principle, Lagrange's equations, basic concepts of kinematics of rigid body motion, dynamics of planar rigid body motion. Application to mechanical engineering problems.
(Cunniff)

ENME 201. ADVANCED DYNAMICS. (3)

Prerequisite, ENME 200. Dynamics of three-dimensional rigid body motion; application of Euler's angles to rigid body motion. Hamilton's equations. Dynamics of gyroscopic instruments. Vibration theory of linear lumped mass systems. Satellite orbits and space vehicle motion. A review of current problems under investigation by research workers.
(Cunniff)

ENME 202. CONTINUUM MECHANICS. (3)

The algebra and calculus of tensors in Riemannian space are developed with special emphasis on those aspects which are most relevant to mechanics. The geometry of curves and surfaces in E-3 is examined. The concepts are applied to the derivation of the field equations for the non-linear theory of continuous media and to various problems arising in classical dynamics.
(Berger, Yang)

ENME 203. LINEAR THEORY OF ELASTICITY. (3)

Prerequisite, ENME 202. The basic equations of the linear theory are developed as a special case of the non-linear theory. The first and second boundary value problems are discussed together with the problem of uniqueness. Solutions are constructed to problems of technical interest through semi-inverse, transform and potential methods. Included are the study of plane problems, torsion, dynamic response of spherical shells and tubes, microstructure and anisotropic materials.
(Berger, Yang)

ENME 204, 205. ADVANCED THERMODYNAMICS. (3, 3)

First and second semesters. Three lectures a week. Prerequisites, ENME 104, ENME 106, ENME 151. Advanced problems in thermodynamics on compression of gases and liquids, combustion and equilibrium, humidification and re-

frigeration and availability. Statistical thermodynamics, partition functions, irreversible processes. Transport phenomena. (Shreeve, Allen)

ENME 206, 207. ADVANCED MECHANICAL ENGINEERING DESIGN. (3, 3)

Prerequisites, ENME 200, 202. Synthesis of stress analysis and properties and characteristics of materials as related to design. Areas covered; combined stress designs, optimizations, composite structures, stress concentrations, design under various environmental conditions, metal working, limit analysis, etc. Review of design literature, design project. (Jackson)

ENME 208, 209. DESIGN OF TURBOMACHINERY. (3, 3)

First and second semesters. Prerequisite, ENME 151. Characteristics and design of turbines, pumps, compressors and torque convertors; cavitation, stall, and surge. (Shreeve)

ENME 210, 211. ADVANCED FLUID MECHANICS. (3, 3)

First and second semesters. Prerequisites, ENME 102, ENME 116. Potential flow theory; three dimensional flow examples: application of complex variables to two-dimensional flow problems; Blasius theorem, circulation and Joukowski hypothesis, engineering applications to cavitation and calculation of pressure distribution; viscous flow and boundary layer. (Sayre, Haberman)

ENME 212. LINEAR VIBRATIONS. (3)

Prerequisite, ENME 157. Fourier and statistical analysis, Transient, steady-state, and random behavior of linear lumped mass systems. Normal mode theory; shock spectrum concepts; mechanical impedance and mobility methods. Vibrations of continuous media including rods, beams, and membranes. (Cunniff)

ENME 213. NON-LINEAR VIBRATIONS. (3)

Prerequisite, ENME 212. Geometrical and numerical analyses of nonlinear systems. Stability, limit cycles. Theory of bifurcations. Perturbation method. Periodic solutions. Oscillations in systems with several degrees of freedom. Asymptotic methods. Nonlinear resonance. Relaxation oscillations. Self-excited vibrations. (Cunniff)

ENME 214, 215. STRESS WAVES IN CONTINUOUS MEDIA. (3, 3)

First and second semesters. Prerequisites, ENME 152 and ENME 157. Methods of characteristics applied to transient phenomena in solids and fluids. Elastic and plastic waves under impact. Shock formation and strain rate effects. (Seigel, Yang)

ENME 216, 217. ENERGY CONVERSION-SOLID STATE. (3, 3)

First and second semesters. Prerequisite, ENME 151. Combustion, thermoelectric, thermionic fuel cells, reactors, magnetohydrodynamics. Kinetics of reactions, fission and fusion. (Talaat, Shreeve)

ENME 218, 219. ENERGY CONVERSION-PLASMA STATE. (3, 3)

First and second semesters. Prerequisite, ENME 151. Design parameters in chemical, nuclear and direct conversion systems for the production of power; weight, efficiency and radiation. (Talaat, Shreeve)

ENME 220. SEMINAR.

Credit in accordance with work outlined by mechanical engineering staff. Prerequisite, graduate standing in mechanical engineering. (Staff)

ENME 223, 224. PLASTICITY. (3, 3)

Prerequisite, ENME 202. Yield criterion and associated flow rules as related to the behavior of materials in the elastic-inelastic region for both perfectly plastic and strain hardenable materials. Plastic behavior of members in the following

areas including; instability, bending, torsion, cylinders, spheres, curved members, limit analysis and metal working theory and applications. (Yang)

ENME 227. NON-LINEAR ELASTICITY. (3)

Prerequisite, ENME 202. This course treats those materials for which the stress at time T depends only on the local configuration at time T . The constitutive equations are developed for elastic and hyperelastic materials through the application of the various invariance requirements. Exact solutions for special non-linear problems are developed. Plane problems, infinitesimal strain superimposed on a given finite strain, wave propagation and stability problems are considered. (Berger)

ENME 228. VISCOELASTICITY. (3)

Prerequisite, ENME 202. This course treats the behavior of solid materials which possess fluid characteristics. Included within this group are Green-Rivlin and hygrosteric materials. The study of objective tensor rates and other invariance requirements leads to the formulation of constitutive equations for various visco-elastic materials. Steady shear flows, helical flow, visco-elastic torsion and problems arising from the linear visco-elastic theory are considered. (Berger)

ENME 229, 230. JET PROPULSION. (3, 3)

First and second semesters. Prerequisites, ENME 150, ENME 151. Types of thermal jet units. Fluid reaction and propulsive efficiency. Performance of rockets, aerothermodynamics, combustion chemical kinetics, aerodynamics of high speed air flow. Solid and liquid propellant rockets. Design of turbojets and aerojets, ramjets and hydroduct units, including combustion chambers, turbines and compressor. (Shreeve)

ENME 231, 232. ADVANCED HEAT TRANSFER. (3, 3)

First and second semesters. Prerequisites, ENME 150, ENME 151. Advanced problems covering effects of radiation, conduction, convection, evaporation and condensation. Study of research literature on heat transfer. (Hsu, Allen)

ENME 233, 234. COMPRESSIBLE FLOW. (3, 3)

First and second semesters. Prerequisite, ENME 104, MATH 066 or ENME 116, ENME 212. One dimensional subsonic and supersonic flow; compressible flow in ducts and nozzles; two and three dimensional subsonic and supersonic flow; similarity rules, normal and oblique shock waves. (Sayre, Haberman)

ENME 235, 236. LINEAR AND NON-LINEAR ELASTIC SHELLS. (3, 3)

Prerequisite, ENME 202. Fundamental results from the theory of surfaces. Theories of shells composed of linear and non-linear elastic materials. Discussion of both infinitesimal and finite deformation states. Strain displacement relationships development to include higher order terms. Derivation of equilibrium equations and their use in static and dynamic stability studies. Constitutive equations for the linear theory. Solutions to special shell problems. (Fourney, Todeschini)

ENME 238. ADVANCED TOPICS IN MECHANICAL ENGINEERING. (2 or 3)

Prerequisite, consent of Instructor. Advanced topics of current interest in the various areas of Mechanical Engineering, may be taken for repeated credit. (Staff)

ENME 280, 281. DYNAMICS OF VISCOUS FLUIDS. (3, 3)

Derivation of Navier Stokes equations, some exact solutions. Boundary layer equations. Laminar Flow-similar solutions, compressibility transformations, analytic approximations, numerical methods. Stability and transition to turbulent flow. Turbulent flow-isotropic turbulence, boundary layer flows, free mixing flows. (This course is equivalent to ENAE 280, 281.) (John)

ENME 282, 283. SPECIAL TOPICS IN UNSTEADY HYDRODYNAMICS. (3, 3)

First and second semesters. Prerequisites, ENME 210, 211. Treatment in depth of several topics in unsteady hydrodynamics such as sloshing in liquid tanks, seismic effects in liquids in large containers and dams, and stationary surface wave phenomena during natural and forced oscillation. Examination of the effects of non-linearities in surface boundary conditions, low gravity and rotation on fluid behavior. Emphasis will be placed on the use of theoretical fundamentals and techniques to solve practical problems. The use of high speed computers will be featured in numerical solutions wherever practicable. (Haberman)

ENME 350. STRUCTURE OF ENGINEERING MATERIALS. (3)

The structural aspects of crystalline and amorphous solids and relationship to bonding types. Point and space groups. Summary of diffraction theory and practice. The Reciprocal Lattice. Relationships of the macroscopically measured properties to crystal symmetry. Structural aspects of defects in crystalline solids.

ENME 351. ELECTRONIC STRUCTURE OF ENGINEERING SOLIDS. (3)

Prerequisite, ENCH 350 or ENME 350. Description of electronic behavior in engineering solids. Behavior of conductors, semiconductors and insulators in electrical fields. Thermal, magnetic and typical properties of engineering solids.

ENME 359. SPECIAL TOPICS IN STRUCTURE OF ENGINEERING MATERIALS. (3)

Prerequisite, consent of Instructor.

ENME 360. CHEMICAL PHYSICS OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. Thermodynamics and statistical mechanics of engineering solids. Cohesion, thermodynamic properties. Theory of solid solutions. Thermodynamics of mechanical, electrical, and magnetic phenomena in solids. Chemical thermodynamics, phase transitions and thermodynamic properties of polycrystalline and polyphase materials. Thermodynamics of defects in solids.

ENME 361. KINETICS OF REACTIONS IN MATERIALS. (3)

Prerequisite, ENCH 360 or ENME 360. The theory of thermally activated processes in solids as applied to diffusion, nucleation and interface motion. Cooperative and diffusionless transformations. Applications selected from processes such as allotropic transformations, precipitation, martensite formation, solidification, ordering and corrosion.

ENME 369. SPECIAL TOPICS IN THE CHEMICAL PHYSICS OF MATERIALS. (3)

Prerequisite, consent of Instructor.

ENME 370. RHEOLOGY OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. Mechanical behavior with emphasis on the continuum point of view and its relationship to structural types. Elasticity, viscoelasticity, anelasticity and plasticity in single phase and multiphase materials.

ENME 371. DISLOCATIONS IN CRYSTALLINE MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350. The nature and interactions of defects in crystalline solids, with primary emphasis on dislocations. The elastic and electric fields associated with dislocations. Effects of imperfections on mechanical and physical properties.

ENME 372. MECHANICAL PROPERTIES OF ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 370 or ENME 370. The mechanical properties of single crystals, polycrystalline and polyphase materials. Yield strength, work hardening, fracture, fatigue and creep are considered in terms of fundamental material properties.

ENME 379. SPECIAL TOPICS IN THE MECHANICAL BEHAVIOR OF ENGINEERING SOLIDS. (3)

Prerequisite, consent of Instructor.

ENME 380. EXPERIMENTAL METHODS IN MATERIALS SCIENCE. (3)

Methods of measuring the structural aspects of materials. Optical and electron microscopy. Microscopic analytical techniques. Resonance methods. Electrical, optical and magnetic measurement techniques. Thermodynamic methods.

ENME 381. DIFFRACTION TECHNIQUES IN MATERIALS SCIENCE. (3)

Prerequisite, ENCH 350 or ENME 350. Theory of diffraction of electrons, neutrons and x-rays. Strong emphasis on diffraction methods as applied to the study of defects in solids. Short range order, thermal vibrations, stacking faults, microstrain.

ENME 389. SPECIAL TOPICS IN EXPERIMENTAL TECHNIQUES IN MATERIALS SCIENCE. (3)

Prerequisite, consent of Instructor.

ENME 390. POLYMERIC ENGINEERING MATERIALS. (3)

Prerequisite, ENCH 350 or ENME 350 or consent of Instructor. A comprehensive summary of the fundamentals of particular interest in the science and applications of polymers. Polymer single crystals, transformation in polymers, fabrication of polymers as to shape and internal structure.

ENME 391. SPECIAL TOPICS IN MATERIALS TECHNOLOGY. (3)

Prerequisite, consent of Instructor.

ENME 397. SEMINAR IN ENGINEERING MATERIALS. (1)

Discussion of current advances and research in engineering solids.

ENME 398. SPECIAL PROBLEMS IN ENGINEERING MATERIALS.

Special study or investigation in Materials Science under the direction of an assigned faculty advisor. Credit variable and since content changes, re-registration is permissible.

ENME 399. RESEARCH IN MECHANICAL ENGINEERING. (Arranged) (M.S. Level)

Credit hours to be arranged. Credit in accordance with work outlined by the staff of Mechanical Engineering. Prerequisites, Graduate standing in Mechanical Engineering. Research in any field of Mechanical Engineering such as fluid mechanics, solid mechanics, thermodynamics and heat transfer, energy conversion, design, systems and controls and materials. (Staff)

ENME 499. Same description as ENME 399. (Ph.D. Level)**MATHEMATICS, CHEMISTRY, AND PHYSICS**

Courses in mathematics, chemistry and physics are offered in the College of Arts and Sciences. Listed below are course descriptions of several courses in each department that are required in the study of engineering.

MATH 019. ANALYSIS I. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, $3\frac{1}{2}$ years of college preparatory mathematics or MATH 018. Sets and inequalities, cartesian coordinates in the plane, the straight line, the circle, translation of coordinate axes, functions and their graphs, limits, continuity, the derivative and application of the derivative antiderivatives, definite integral.

MATH 020. ANALYSIS II. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 019 or equivalent.

Applications of integration, techniques of integration, polar coordinates, basic properties of the elementary functions, improper integrals and indeterminate forms.

MATH 021. ANALYSIS III. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 020 or equivalent. Solid analytic geometry, sequences, infinite series, partial differentiation and multiple integration.

MATH 022. ANALYSIS IV. (4)

(3 lectures, 2 drill periods per week.) Prerequisite, MATH 021 or equivalent. Basic concepts of linear algebra, matrices and determinants. Calculus of functions of vectors, implicit function theorem, service integrals, classical theorems of Green, Gauss, and Stokes.

MATH 066. DIFFERENTIAL EQUATIONS FOR SCIENTISTS AND ENGINEERS. (3)

Prerequisite, MATH 021 or equivalent. The field of direction and graphic solutions of first order differential equations. The simplest methods of numerical solution. Systems of differential equations. Introduction to Fourier series, and applications.

CHEM 001, 003. GENERAL CHEMISTRY. (4, 4)

Two lectures, one quiz, and one three-hour laboratory period per week. Prerequisite, 1 year high school algebra or equivalent.

PHYS 030. GENERAL PHYSICS—MECHANICS AND PRACTICE DYNAMICS. (3)

Three lectures and one recitation per week. MATH 020 to be taken concurrently. Laws of motion, force and energy; principles of mechanics; collisions; rotation and gravitation.

PHYS 031. GENERAL PHYSICS—HEAT, WAVES AND RELATIVITY. (4)

Three lectures, one recitation and one three-hour laboratory per week. Prerequisite, PHYS 030. Statistical physics; kinetic theory; wave motion; interference and refraction; special theory of relativity.

PHYS 032. GENERAL PHYSICS—ELECTRICITY AND MAGNETISM. (4)

Three lectures, one recitation and one three-hour laboratory per week. Prerequisite, PHYS 031. May be taken in lieu of repetition of PHYS 021. Electrostatics; electrodynamics; Maxwell's equations; quantum physics.



PLASMA RESEARCH—Looking much like a complicated pressure cooker, this experimental apparatus creates charged atoms of carbon to investigate atomic collision processes. NASA trainee H. Jay Zwally wears white gloves as he prepares the vacuum chamber for an experiment.

The Faculty

COLLEGE OF ENGINEERING

GLENN L. MARTIN INSTITUTE OF TECHNOLOGY

BECKMANN, ROBERT BADER, Dean
 JOHNSON, EVERETT RAMON, Associate Dean
 WOCKENFUSS, WILLIAM ARTHUR, Assistant Dean

Department Heads

BACHTLER, Joseph deRolle, Director, Fire Service Extension Department
 BRYAN, John Leland, Head, Fire Protection Curriculum
 DE CLARIS, Nicholas, Head, Department of Electrical Engineering
 FRENIER, Richard, Librarian, Engineering and Physical Sciences
 GROSS, Donald Shaeffer, Director, Wind Tunnel Operations
 LOONEY, Charles Thomas George, Head, Department of Civil Engineering
 MARCHELLO, Joseph M., Head, Department of Chemical Engineering
 SHREEVE, Charles Alfred, Jr., Head, Department of Mechanical Engineering
 THOMAS, Richard E., Head, Aerospace Engineering
 WILKERSON, Thomas D., Acting Director, Institute of Fluid Dynamics and Applied Mathematics

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ALLEN, Redfield Wilmerton, Professor of Mechanical Engineering
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ALLEN, Russell Bennett, Professor Emeritus of the College of Engineering and Professor of Civil Engineering
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- ARMSTRONG, Ronald W.**, Professor of Mechanical Engineering
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- ARSENAULT, Richard G.**, Associate Professor of Chemical Engineering
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- BABUSKA, Ivo**, Visiting Research Professor of Fluid Dynamics and Applied Mathematics
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- BACHTLER, Joseph deRolle**, Director, Fire Service Extension
B.S., University of Southern California, 1956.
- BASHAM, Ray Scott**, Associate Professor of Electrical Engineering
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- BECKER, Roger D.**, Instructor in Mechanical Engineering
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- BECKMANN, Robert Bader**, Dean of the College of Engineering and Professor of Chemical Engineering
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B.S., Agra Univ., 1952; M.S., Agra Univ., 1954; M.S., Agra Univ., 1956; Ph.D., Technische Hochschule, 1961.
- BISCHOFF, Kenneth B.**, Professor, Chemical Engineering
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- BIRKNER, Francis Bruno**, Assistant Professor in Civil Engineering
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- BIXON, Mordechai**, Science Development Grant Postdoctoral Fellow of Fluid Dynamics and Applied Mathematics
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- BOLSAITIS, Pedro (Peter)**, Assistant Professor of Chemical Engineering
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- BOWERS, Allen Atvill**, Project Engineer, Wind Tunnel Operations
B.S., University of Maryland, 1952.
- BROWNE, Vance D.**, Instructor in Mechanical Engineering
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- BRUSH, Stephen G.**, Associate Professor of Fluid Dynamics and Applied Mathematics
A.B., Harvard 1955; Ph.D., Oxford Univ., 1958.
- BRYAN, John Leland**, Professor and Head, Fire Protection Curriculum
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Doctor of Mathematics and Physics, University of Leiden, 1918; Doctor Honoris Causa, University Libre de Bruxelles, 1948; Doctor Honoris Causa, University of Poitiers (France), 1950.

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COLBURN, Theodore R., Instructor in Electrical Engineering
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COOKSON, John T., Jr., Associate Professor of Civil Engineering
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COPLAN, Mihcael A., Research Assistant Professor, Institute for Fluid Dynamics and Applied Mathematics
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CORNING, Gerald, Professor of Aerospace Engineering
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COURNYN, John Burton, Associate Professor of Civil Engineering
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CUNNIFF, Patrick F., Associate Professor of Mechanical Engineering
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CUSTER, Richard L. P., Lecturer in Fire Protection
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DAGOLD, Reuben Gordon, Assistant Project Engineer, Wind Tunnel Operations
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- DUFFEY, Dick**, Professor of Chemical Engineering.
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- DUNPHY, Robert Townsend**, Instructor in Civil Engineering
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- ELKINS, Richard L.**, Assistant Professor of Mechanical Engineering
B.S., University of Maryland, 1953; M.A., 1958.
- ELSASSER, Walter M.**, Research Professor, Institute for Fluid Dynamics and Applied Mathematics
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- EMAD, Fawzi P.**, Assistant Professor of Electrical Engineering
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- FALLER, Alan Judson**, Research Professor, Institute for Fluid Dynamics and Applied Mathematics and Lecturer in Aerospace Engineering
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- FEARNSIDES, John J.**, Instructor of Electrical Engineering
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- FERRIS, Clifford Duras**, Associate Professor of Electrical Engineering
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- FISHER, Franklin E.**, Instructor in Mechanical Engineering
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- FOURNEY, William Lawrence**, Assistant Professor of Mechanical Engineering
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- FRENIER, Richard W.**, Head, Engineering and Physical Sciences Library
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- FRIEDMAN, Gerald Edward**, Assistant Professor in Electrical Engineering
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- GENTRY, James W., Assistant Professor of Chemical Engineering
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- GINNINGS, Robert Meade, Associate Professor of Electrical Engineering
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- GLOCK, Russell, Jr., Instructor in Electrical Engineering
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- HARGER, Robert O., Visiting Associate Professor of Electrical Engineering
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- HAYLECK, Charles Raymond, Jr., Associate Professor of Mechanical Engineering
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- ISRAEL, Gerhard Wilhelm**, Assistant Professor in Civil Engineering
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- LE-VINE, David M., Assistant Professor of Electrical Engineering
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- LIEBERMANN, Alfred, Assistant Professor of Electrical Engineering
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- MARKS, Colin H., Associate Professor of Mechanical Engineering
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- OGILVIE, W. Keith, Research Associate Professor (P/T), Institute for Fluid Dynamics and Applied Mathematics
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- OTTS, Louis Ethelbert, Jr., Professor of Civil Engineering
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COLLEGE OF HOME ECONOMICS

1969-1970

UNIVERSITY OF MARYLAND



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University Calendar, 1969-1970

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
AUGUST	4-8	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

*1969-1970**FALL SEMESTER, 1969*

SEPTEMBER	8-12	Monday-Friday	Fall Semester Registration
	13	Saturday	Teacher Registration
	15	Monday	Instruction begins
NOVEMBER	26	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	1	Monday	8:00 a.m.—Christmas recess ends
	19	Friday	After last class—Christmas recess begins

1970

JANUARY	5	Monday	8:00 a.m.—Thanksgiving recess ends
	14	Wednesday	Pre-exam Study Day
	15-22	Thursday-Thursday	Fall Semester examinations

SPRING SEMESTER, 1970

FEBRUARY	2-6	Monday-Friday	Spring Semester Registration
	7	Saturday	Teacher Registration
	9	Monday	Instruction begins
MARCH	26	Thursday	After last class—Spring recess begins
APRIL	6	Monday	8:00 a.m.—Spring recess ends
MAY	27	Wednesday	Pre-exam Study Day
	28-June 5	Thursday-Friday	Spring Semester Examinations
JUNE	1	Monday	Memorial Day
	6	Saturday	Commencement

SUMMER SESSION, 1970

JUNE	22-23	Monday-Tuesday	Summer Registration
JUNE	24	Wednesday	Instruction begins
AUGUST	14	Friday	Summer Session ends

SHORT COURSES, 1970

JUNE	15-18	Monday-Thursday	College Week for Women
AUGUST	3-7	Monday-Friday	Maryland 4-H Club Week
SEPTEMBER	8-11	Tuesday-Friday	Fireman's Short Course

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Standing Committees, Faculty Senate

GENERAL COMMITTEE ON EDUCATIONAL POLICY

GENERAL COMMITTEE ON STUDENT LIFE, WELFARE, RIGHTS AND RESPONSIBILITIES

ADJUNCT COMMITTEES: STUDENT ACTIVITIES
 FINANCIAL AID AND SELF-HELP
 STUDENT PUBLICATIONS AND COMMUNICATIONS
 RELIGIOUS LIFE
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FACULTY LIFE AND WELFARE

MEMBERSHIP AND REPRESENTATION

COUNSELING OF STUDENTS

BALTIMORE CITY CAMPUS AFFAIRS

ADJUNCT COMMITTEE: BALTIMORE CITY CAMPUS STUDENT AFFAIRS

THE FUTURE OF THE UNIVERSITY



MARJORY BROOKS, B.S., M.S., PH.D.
DEAN

The College

The College of Home Economics serves Maryland and surrounding areas with its program for the education of young men and women interested in the social, economic, scientific and aesthetic aspects of family living in relation to the community. The educational offerings of the College are planned to help students function effectively and creatively as individuals, as family members and as responsible citizens; to prepare them for positions for which home economics is a major or minor preparation; and to promote an appreciation for and utilization of the findings of research. The College is concerned with contributing to the education for home and family life of women and men enrolled in other schools and colleges as well as those majoring in home economics.

The over-all function of home economics is to integrate the contributions of the physical and biological sciences, the social sciences, psychology, philosophy and art in the treatment of all phases of family life, to the end that they are used by families in all parts of society and by the agencies serving families.

The College of Home Economics is organized into the Departments of Food, Nutrition, and Institution Administration; Family and Community Development; Housing and Applied Design; and Textiles and Clothing. The curricula offered are: Family studies, community studies, management and consumer studies; applied design (crafts, advertising, costume, housing and interiors); experimental foods; nutrition; dietetics; institution administration; home economics education; textiles and clothing; and textiles and related science.

Special Facilities and Activities

PHYSICAL FACILITIES

The home of the College of Home Economics, following campus tradition, is a colonial brick building, planned and built to present modern equipment and facilities for education in home economics. A management center is maintained on the campus for resident experiences in management activities of family life.

Located between two large cities, unusual opportunities are provided for both faculty and students. In addition to the University's general and specialized libraries, Baltimore and Washington furnish added library facilities. The art galleries and museums, the government bureaus and city institutions stimulate study and provide enriching experiences for home economics students.

Societies

HOME ECONOMICS CHAPTERS

Membership is open to all home economics students. The club is affiliated with the Maryland and American Home Economics Associations.

OMICRON NU

National home economics honor society. Students of high scholarship are eligible for election to membership.

N.S.I.D.

A student chapter affiliated with the National Society of Interior Designers.

GAMMA ALPHA CHI

National professional advertising fraternity for women.

STUDENT FACULTY COUNCIL

An advisory group, elected by students and faculty, to promote the interests of the College of Home Economics.

Honors and Awards, Scholarships and Loan Fund

THE DANFORTH FOUNDATION AND THE RALSTON PURINA COMPANY SUMMER FELLOWSHIPS

One of four weeks to an outstanding junior; one of two weeks to an outstanding freshman.

OMICRON NU SCHOLARSHIP AWARD

Omicron Nu presents annually an award to the sophomore in the College of Home Economics who attained the highest scholastic average during the freshman year.

M. MARIE MOUNT MEMORIAL SCHOLARSHIP

\$250 is awarded each year to a junior or senior student who shows outstanding potential as a professional home economist.

SEARS ROEBUCK SCHOLARSHIPS

The Sears Roebuck Foundation has made available to freshmen in the College of Home Economics two scholarships of \$300 each.

VENIA M. KELLAR GRANT

A grant of \$100 is open to a Maryland student of promise who wishes to enroll in the College of Home Economics.

A LOAN FUND, composed of contributions by the District of Columbia Home Economics Association, Maryland Chapter of Omicron Nu, and personal gifts, is available for students majoring in home economics.

HOME ECONOMICS SENIOR AWARD

The Home Economics Alumni annually present an award to the senior student who is outstanding in her application of the spirit and principles of home economics in her present living and who best shows promise of carrying these into her future home and community.

FOR OTHER SCHOLARSHIPS AND AWARDS, see *An Adventure in Learning*, the general undergraduate catalog of the University.

Academic Information

Admission

GENERAL STATEMENT. The University of Maryland, in all its branches and divisions, subscribes to a policy of equal educational opportunity for peoples of all races, creeds and ethnic origins.

FALL SEMESTER

All applications for full-time undergraduate admission for the Fall Semester at the College Park Campus must be received by the University on or before June 1. High school students are encouraged to file their applications for admission during the fall months of their senior year. (Note: Foreign students must submit applications six months in advance.) Any student registering for nine or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between June 1 and July 15. Applicants for full-time attendance filing after June 1 will be required to pay a non-refundable \$25 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10 application fee.

All undergraduate applications, both for full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by July 15. This means that the applicant's educational records, SAT scores (in the case of new freshmen) and medical examination report must be received by July 15.

SPRING SEMESTER

The deadline for the receipt of applications for the Spring Semester is January 1. (Note: Foreign students must submit applications six months in advance.)

UNIVERSITY COLLEGE

The application deadlines and fees *do not* apply to students registering in the evening classes offered by the University College.

All students desiring to enroll in the College of Home Economics must apply to the Director of Admissions of the University of Maryland at College Park.

In selecting students emphasis will be placed upon good marks and other indications of probable success in college as well as upon the pattern of subjects pursued in high school. In general, four units of English and one unit each of social and natural sciences, algebra and plane geometry are required. While foreign language is desirable for certain programs no foreign language is required for entrance.

Costs

Actual annual costs of attending the University include \$390.00 fixed charges; \$116.00 special fee, \$540.00 board (full contract), \$360.00 lodging for Maryland residents or \$460.00 for residents of other states and countries. A charge of \$500.00 is assessed students not residents of the State of Maryland. A matriculation fee of \$10.00 is charged all new students. A fee of \$10.00 must accompany a prospective student's application for admission. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. Applicants for the September term who are found to meet admissions requirements may be sent an offer of admission, and they are then required to submit the enrollment deposit of \$50 within three weeks after the date of this offer. Failure to submit the enrollment deposit within the required time limit will be taken as evidence that the applicant is not seriously interested in admission and the offer will be cancelled.

An Adventure in Learning, the undergraduate catalog of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park 20742.

Degrees

The degree of Bachelor of Science is conferred for the satisfactory completion, with an average of "C" or better, of a prescribed curriculum of 120 academic semester hour credits. This is exclusive of health and physical activities for women and men. No grade below a "C" is acceptable in courses within the field chosen as a major.

The Master of Science degree is offered in food, nutrition and institution administration; in textiles and clothing; and in related areas of home economics in the College of Home Economics, also in home economics education in the College of Education. (See the *Graduate School Catalog*.)

Graduate School

Application for admission to the Graduate School must be made by July 15 for the fall term and by December 15 for the spring term on blanks obtained from the Office of the Graduate School. Admission to the summer session is governed by the date listed in the Summer School catalog. The summer session deadline date is May 15.

Air Science Instruction

Selected students who wish to do so may carry Advanced Air Science courses

during their junior and senior years which may lead to a regular or reserve commission in the United States Air Force.

For details concerning Air Science, refer to *University General and Academic Regulations*, a publication available to all entering undergraduate students.

The Student Load

The student load in the College of Home Economics varies from 15-19 credits. A student wishing to carry more than 19 credits must have a "B" grade average and permission of the Dean.

A minimum of 120 academic credits are required for graduation. However, for certification in some professional organizations additional credits are required. Consult your adviser.

Curricula

A student may elect one of the following curricula, or a combination of curricula: food, nutrition or institution administration (food service); family, community, or consumer studies; home economics education; housing, applied design or crafts; textiles or textiles and clothing. A student who wishes to teach home economics may register in home economics education in the College of Home Economics or in the College of Education.

General Education Program

A college education implies something more than an adequate technical training in the student's field of specialization. In order that each graduate with a Bachelor's degree may gain a liberal education as well as a specialized one, the University has established a General Education Requirement. This requirement consists of 34 semester hours of credit in six general fields. There is a wide choice in specific courses which may be used to satisfy requirements in all of the six fields except English. Physical Education and Health requirements for all students are taken in addition to this 34-hour group of courses.

Although the courses in the General Education Program are prescribed generally, some choice is permitted, especially for students who demonstrate in classification tests good previous preparation in one or more of the required subjects. For a more complete description of the program refer to *University General and Academic Regulations*.

General Information

Detailed information concerning the General Education Program, fees and expenses, scholarships and awards, student life, and other material of a general nature, may be found in the University publication titled *An Adventure in Learning*. This publication may be obtained on request from the Catalog Mailing Office, North Administration Building, University of Maryland at College Park 20742. A detailed explanation of the regulations of student and academic life may be found in the University publication titled, *General and Academic Regulations*.

Requests for course catalogs for the individual schools and colleges should be directed as follows:

COLLEGES LOCATED AT COLLEGE PARK:

Dean

(College in which you are interested)

The University of Maryland

College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean

(School in which you are interested)

The University of Maryland

Lombard and Greene Streets

Baltimore, Maryland 21201

Required Courses

THE CURRICULA LEADING TO A MAJOR IN THE COLLEGE OF HOME ECONOMICS are organized into three categories: (1) Technical areas, (2) educational, community, and family life areas, and (3) consumer service areas. These represent the broad professional fields into which graduates are eligible to enter and pursue their chosen work. The positions vary in nature, scope, and title, but require similar general studies background and fundamentals for specialization.

Individual programs of study are developed cooperatively with faculty advisors to provide a balanced and sequential arrangement of studies in preparation for the chosen field. University, college, departmental, and interdepartmental requirements are identified for curricula in each of the categories described above.

All students in the College of Home Economics are required to complete a series or sequence of courses to satisfy University requirements and departmental requirements. The remaining courses needed to complete a program of study are elected by the student with the approval of his adviser.

UNIVERSITY REQUIREMENTS

<i>(General Education—Academic)</i>	<i>Semester Credit Hours</i>
ENGL 001 or ENGL 021, 003, 004.....	9
<i>Fine Arts or Philosophy (choice of one)</i>	3
DANC 032, 182 or 183, 184	
Art 010, 060, 061, 062, 065, 066, 067, 068, 070, 071, 080, 081	
MUSC 020	
SPCH 016, 114	
PHIL 001, 041, 045, 052, 053, 056, 147, 152, 154	
<i>History</i> (any combination of History courses for which the student is eligible except State History)	6
<i>Mathematics</i> (any credit bearing course)	3-4
SAT score determines qualification	
<i>Natural Science</i> (choice of two courses) ¹	7
One course must be a physical science and the other a biological science. One of them must be a laboratory (4 hour) course.	
<i>Social Science</i> (choice of two courses)	6
SOCY 001, 003; ANTH 001; ECON 037 or 031;	
GVPT 001, GVPT 003, or GVPT 101; PSYC 001	
Total	34-35

¹Dependent upon science requirements of curriculum.



(Non-Academic)

For men and women:

HLTH 005	2
Physical Education—2 semesters	2
Total	<hr/> 4

COLLEGE OF HOME ECONOMICS REQUIREMENTS

for every student

APDS 001—Fundamentals of Design or APDS 004—Survey of Art History	3
TXCL 005—Textiles and Clothing in Contemporary Living	3
FDNT 005—Food and Nutrition of Individuals and Families or NUTR 020—Elements of Nutrition	3
FMCD 050—Decision Making in Family Living	3

ROOT DISCIPLINE REQUIREMENTS OUTSIDE THE COLLEGE

SOCY 001—Sociology of American Life ²	3
PSYC 001—Introduction to Psychology ²	3
ECON 037—Fundamentals of Economics ²	3
SPCH 007 or 001—Public Speaking	2-3

DEPARTMENTAL REQUIREMENTS

Required courses are determined by the department making major contributions to the specific curriculum or program of study. Supporting and elective courses are approved by the adviser of the student's program.

The program of courses for the freshman year is essentially the same for all students. However, there are some variations and modifications in several curricula.

TYPICAL FRESHMAN YEAR (15 to 18 hours each semester)

	<i>Semester Hours</i>
ENGL 001, 003—Composition and Literature	6
Mathematics	0-3
FMCD 005—Introduction to Family Living ³	3
APDS 001—Fundamentals of Design	3
SPCH 007 or 001—Public Speaking	2-3
SOCY 001—Sociology of American Life	3
FDNT 005—Food and Nutrition of Individuals and Families ..	3
TXCL 005—Textiles and Clothing in Contemporary Living	3
Physical or Biological Science	3-6
HLTH 005	2
Physical Education	2
Electives ⁴	4

²Any two of these automatically satisfy the 6-hour social science requirement of General Education.

³Required for H.E. Education and Family and Community Development majors.

⁴CLTH 010 required for Textiles and Clothing majors.

DEPARTMENT OF FOOD, NUTRITION AND INSTITUTION ADMINISTRATION

The area of food, nutrition and institution administration is broad and offers many diverse professional opportunities. Courses introduce the student to the principles of selection, preparation and utilization of food for human health and the welfare of society. Emphasis is placed on the scientific, cultural and professional aspects of this broad area of food and nutrition. The department offers four areas of emphasis: Experimental Foods, Nutrition, Dietetics, and Institution Administration. Each program provides for competencies in several areas of work; however, each option is designed specifically for certain professional careers.

All areas of emphasis have in common several courses within the Department and the University; the curricula are identical in the Freshman and Sophomore years.

Experimental Foods is designed to develop competency in the scientific principles of food and their reactions. Physical and biological science in relation to foods are emphasized. The program is planned for students who are interested in product development, quality control, and technical research in foods. The Nutrition program is designed to develop competency in the area of nutrition for students who wish to emphasize physical and biological sciences. Dietetics develops an understanding and competency in food, nutrition and management as related to problems of dietary departments. The curriculum includes courses necessary to meet the academic requirements for American Dietetic Association internship and membership. Institution Administration emphasis is related to the administration of quantity food service in university and college residence halls and student unions, school lunch programs in elementary and secondary schools, restaurants, coffee shops and industrial cafeterias. The curriculum meets academic requirements for approved college, industry or business internship and membership in the American Dietetic Association.

FOOD AND NUTRITION CURRICULUM

	Semester	
	I	II
FRESHMAN YEAR		
ENGL 001, 003—Composition and World Literature.....	3	3
MATH 010 or 018	3	
APDS 001 or APDS 004—Fundamentals or History of Design		3
SPCH 007—Public Speaking	2	
FDNT 005—Food and Nutrition of Individuals and Families	3	
TXCL 005—Textiles and Clothing in Contemporary Living		3
CHEM 001, 003—General Chemistry	4	4
HLTH 005—Science and Theory of Health.....		2
PE 000—Physical Education	1	1
Total	16	16

SOPHOMORE YEAR	Semester	
	I	II
ENGL 004—World Literature	3	
CHEM 031, 033—Elements of Organic Chemistry	3	3
FOOD 052, 053—Science of Food Preparation	3	3
ECON 037—Fundamentals of Economics		3
PSYC 001—Introduction to Psychology	3	
ZOOL 001—General Zoology	4	
MICB 001—General Microbiology		4
FMCD 050—Decision Making in Family Living		3
FDNT 050—Professional Orientation		1
Total	16	17

EXPERIMENTAL FOODS EMPHASIS

JUNIOR YEAR	Semester	
	I	II
HIST—U.S. and non U.S. History	3	3
SOCY 001 or 141—Introduction to Sociology or Sociology of Personality	3	
Fine Arts or Philosophy requirement	3	
NUTR 121—Science of Nutrition		3
FOOD 152, 153—Advanced and Experimental Food Science	3	3
CHEM 161, 163—Biochemistry	2	3
FDSC 102—Principles of Food Processing		3
Total	14	15

SENIOR YEAR		
PHYS 001—Elements of Physics	3	
FDSC 112—Analytical Quality Control		3
FDSC 131—Food Product Research and Development		3
Electives ⁵	12	9
Total	15	15

⁵ 9 hours of the 21 electives must be selected from the following list:

- AGRI 101—Agricultural Biometrics (3) or FDSC 113—Statistical Quality Control (3)
- CHEM 019—Elements of Quantitative Analysis (4)
- NUTR 124—Advanced Nutrition (3)
- FOOD 130—Special Problems in Foods (3)
- FOOD 060—Meal Management (3)
- FOOD 170—Economics of Food Consumption (3)
- MICB 081—Applied Microbiology (4)
- IADM 151—Food Purchasing and Cost Control (3)
- IADM 152—Quantity Food Production (3)
- FMCD 170—Communication Skills and Techniques in Home Economics (3)
- AGEN 113—Mechanics of Food Processing (4)

NUTRITION EMPHASIS

JUNIOR YEAR	Semester	
	I	II
History Requirement	3	3
SOCY 001 or 141—Introduction to Sociology or Sociology of Personality	3	
Fine Arts or Philosophy requirement		3
FOOD 060—Meal Management	3	
CHEM 161, 163—Biochemistry	2	3
ZOOL 014, 015—Human Anatomy and Physiology	4	4
NUTR 121—Science of Nutrition		3
Total	15	16
SENIOR		
NUTR 124, 125—Advanced and Therapeutic Nutrition	3	3
NUTR 130—Special Problems in Nutrition		3
Electives ⁶	11	8
Total	14	14

⁶ 9 hours of the 19 electives must be selected from the following list:

- AGRI 101—Agricultural Biometrics (3)
- PSYC 110—Educational Psychology (3)
- CHEM 019—Elements of Quantitative Analysis (4)
- CHEM 162—Biochemistry Lab. (2)
- CHEM 164—Biochemistry Lab. (2)
- NUTR 140—Maternal, Infant and Child Nutrition (2)
- NUTR 145—International Nutrition (2)
- NUTR 150—History of Nutrition (2)
- FOOD 170—Economics of Food Consumption (3)
- FMCD 170—Communication Skills and Techniques in Home Economics (3)

INSTITUTION ADMINISTRATION EMPHASIS

JUNIOR YEAR	Semester	
	I	II
History Requirement	3	
SOCY 001 or 141—Introduction to Sociology or Sociology of Personality	3	
NUTR 121—Science of Nutrition		3
IADM 150—Food Service Organization and Management ..	2	
IADM 152—Quantity Food Production		3
ZOOL 014, 015—Anatomy and Physiology ⁷	4	4
BSAD 020—Accounting	3	
BSAD 021—Accounting		3
Electives		2
Total	15	15

⁷ Students not planning to meet academic requirements for ADA may substitute approved additional courses in business administration of the social sciences.

SENIOR YEAR

IADM 151—Food Purchasing and Cost Control	3	
IADM 153—Food Service Personnel Administration		2
IADM 155—Food Service Equipment and Planning	3	
BSAD 180 or ECON 160—Business Law or Labor Economics	3	
IADM 130 or 140—Special Problems or Practicum in Institution Administration		3
History Requirement	3	
Fine Arts or Philosophy requirement		3
Electives	3	6
Total	15	14

Suggested Electives: FOOD 152, 153, 170; JOUR 116; INED 125; PSYC 110.

DIETETIC EMPHASIS

JUNIOR YEAR

	Semester	
	I	II
NUTR 121—Science of Nutrition		3
CHEM 161, 163—Biochemistry	2	3
ZOOL 014, 015—Anatomy and Physiology	4	4
FOOD 060—Meal Management	3	
History Requirement	3	3
IADM 150—Food Service Organization and Management ..	2	
IADM 152—Quantity Food Production		3
Total	14	16

SENIOR YEAR

NUTR 124, 125—Advanced and Therapeutic Nutrition	3	3
IADM 151—Food Purchasing and Cost Control	3	
IADM 153—Food Service Personnel Administration		2
IADM 155—Food Service Equipment and Planning	3	
PSYC 110—Educational Psychology		3
Fine Arts or Philosophy requirement	3	
SOCY 001 or 141—Introduction to Sociology or Sociology of Personality		3
Electives	3	3
Total	15	14

DEPARTMENT OF TEXTILES AND CLOTHING

The curricula in textiles and clothing are planned to help students be intelligent and responsible consumers; to give them preliminary training for positions in textiles and clothing in business, in textile testing, and for research in textiles and clothing.

Men majoring in these curricula will be allowed substitutions for certain required courses and will choose supporting courses according to their professional interests and needs.

TEXTILES CURRICULUM

	Semester	
	I	II
SOPHOMORE YEAR		
ENGL 004—World Literature	3	(3)
CLTH 010—Principles and Methods of Clothing Design	2	(2)
ECON 037—Fundamentals of Economics	3	(3)
PSYC 001—Introduction to Psychology	3	(3)
APDS 020—Introduction to Fashion Design	(3)	3
CHEM 001, 003—General Chemistry or elective	3-4	3-4
CLTH 011—Experimental Clothing Design or		
CLTH 021—Pattern Design	(2-3)	2-3
TEXT 055—Elements of Textiles	3	..
FMCD 050—Decision Making in Family Living .....	..	3
Electives .....	..	3
Total	17-18	14-16

	Semester	
	I	II
JUNIOR YEAR		
Fine Arts Elective .....	..	3
PHYS 001, 002—Elements of Physics	3	3
CHEM 031, 033—Organic Chemistry	3	3
BSAD 130—Elements of Business Statistics .....	..	3
Electives	9	3
Total	15	15

SENIOR YEAR		
HIST 021, 031 or alternatives	3	3
Chemistry or other science	4	..
TEXT 150—Advanced Textiles	3	..
TEXT 102—Textile Testing .....	..	3
Speech*		3
EDHD 107—Growth and Development in Early Child.		
hood or		
FMCD 132—The Child in the Family	3	..
FMCD 180—Professional Seminar	2	..
Electives .....	..	7
Total	15	16

TEXTILES AND CLOTHING CURRICULUM

SOPHOMORE YEAR		
ENGL 004—Composition and World Literature	3	(3)
ECON 037—Fundamentals of Economics .....	..	3
PSYC 001—Introduction to Psychology	3	(3)
APDS 020—Introduction to Fashion Design	(3)	3
Science	(4)	4
CLTH 011—Experimental Clothing Design	2	(2)
CLTH 021—Pattern Design	(3)	3
TEXT 050—Consumer Textiles	3	(3)
FMCD 050—Decision Making in Family Living	3	..
Elective .....	..	3
Total	14	16

* Selected with adviser's consent.

JUNIOR YEAR	Semester	
	I	II
Philosophy or Fine Arts .....	..	3
CLTH 122—Tailoring	2	..
Art ^o	3	..
Psychology ^o .....	..	3
EDHD 107—Growth and Development in Early Childhood or		
FMCD 132—The Child in the Family	3	..
TEXT 153—International Textiles	2	..
Choice of course in Dept. or		
FMCD 170—Communication Skills and Techniques in		
Home Economics .....	..	3
Electives	6	6
Total	16	15
SENIOR YEAR		
HIST 021 and 031 or alternative	3	3
CLTH 120—Draping	3	..
TXCL 126—Fundamentals of Fashion .....	..	3
SPCH ^o	3	(3)
FMCD 180—Professional Seminar	2	(2)
Electives (100 level)	3	9
Total	14	15

^o Selected with adviser's consent.

DEPARTMENT OF FAMILY AND COMMUNITY DEVELOPMENT

In the fall of 1968 the areas of (1) General Home Economics, (2) Extension, (3) Family Life and Management, and (4) Home Economics Education in this college were integrated as one department, the Department of Family and Community Development. Commitments to students who entered the General or Extension programs prior to or at registration in the spring of 1969 will be fulfilled, but future students will enroll in one of the newly devised areas of concentration within the Department of Family and Community Development: Family Studies, Community Studies, Management and Consumer Studies, or Home Economics Education.* Students who formerly would have enrolled in the Extension curriculum will enroll in the Community Studies emphasis.

These areas of concentration will prepare students for roles as family life educators, extension specialists, consumer consultants, mental health team members, and teachers of home economics at the secondary level.

*Students in Home Economics Education may enroll in either the College of Home Economics of the College of Education.

FAMILY STUDIES CURRICULUM

Supportive courses will be selected from either Home Economics or Sociology-Psychology.

FRESHMAN YEAR	<i>Semester Hours</i>
ENGL 001, 003—Composition and Literature	6
PSYC 001	3
FMCD 005—Introduction to Family Living	3
APDS 001—Fundamentals of Design OR	
APDS 004—Art History	3
SOCY 001—Sociology of American Life	3
FDNT 005—Food and Nutrition of Individuals and Families	
OR NUTR 020	3
TXCL 005—Textiles and Clothing in Contemporary Living	3
Biological Science	4
Health and Physical Education Requirements	4
Total	32

SOPHOMORE YEAR	<i>Semester Hours</i>
ENGL 004—Composition and World Literature	3
Physical Science	3-4
SPCH 007 OR 001—Public Speaking	2-3
ECON 037—Fundamentals of Economics	3
Fine Arts OR Philosophy	3
Math Requirement	3
FMCD 050—Decision Making in Family Living	3
FMCD 060—Family Relations	3
Supportive Courses	6
Electives	3
Total	32-34

JUNIOR YEAR	<i>Semester Hours</i>
FMCD 131—Family Crisis and Disintegration	3
FMCD 130—Family Patterns	3
EDHD 105, 106 OR 107—Human Development	6
History Requirement	6
FMCD 132—The Child in the Family	3
Supportive Courses	6
Electives	6
Total	33

SENIOR YEAR	<i>Semester Hours</i>
FMCD 188—Legal Aspects of Family Problems	3
FMCD 185—Introduction to Family Counseling	3
FMCD 145 OR 146—Practicum or Living Experience	
with Families	3-6
Supportive Courses	6
FMCD 180 or Elective	2
Electives	10

 27-30

COMMUNITY STUDIES CURRICULUM

Supportive courses will be chosen from the following areas:

Home Economics courses.

Sociology and/or Psychology or Family Life courses in the Department of Family and Community Development beyond the core requirements.

Government and/or Economics, or management and consumer economics courses in the Department of Family and Community Development beyond the core requirements.

FRESHMAN YEAR

Semester Hours

ENGL 001, 003—Composition and Literature	6
Math Requirement	3
SOCY 001—Introduction to Sociology	3
FDNT 005—Food & Nutr. of Individuals & Families OR NUTR 020	3
FMCD 005—Introduction to Family Living	3
Biological Science	4
APDS 001—Fund. of Design OR APDS 004—Art History	3
TXCL 005—Tex. & Clo. in Contemporary Living	3
PSYC 001—Introduction to Psychology	3
Physical Education and Health Requirement	4
Total	35

SOPHOMORE YEAR

Semester Hours

ENGL 004—World Literature	3
Fine Arts or Philosophy	3
CHEM 001 (or other Science)	3-4
ECON 037—Fund. of Economics	3
FMCD 050—Decision Making in Family Living	3
SPCH 007 or 001—Public Speaking	2-3
FOOD 010—Scientific Principles of Food	3
Supportive Courses	6
Electives	3
Total	29-30

JUNIOR YEAR

Semester Hours

FMCD 130—Family Patterns	3
FMCD 141—Personal and Family Finance	3
FMCD 145—Practicum with Families OR FMCD 144—Residence Experience OR FMCD 146—Living Experiences with Families	3
SOCY 071—Dynamics of Social Interaction	3
FOOD 060—Meal Management OR FOOD 170—Economics of Food Consumption	3
Supportive Courses	9
Electives	6
Total	30

SENIOR YEAR

Semester Hours

FMCD 180—Professional Seminar or elective	2
FMCD 170—Communication Skills	3
History Requirement	6
Supportive Courses	12
Electives	6
Total	29

MANAGEMENT AND CONSUMER CURRICULUM

Supportive courses will be selected in blocks from Economics, Business Administration, Public Relations, Sociology, Psychology or Family Life.

FRESHMAN YEAR

Semester Hours

ENGL 001, 003—Composition and Literature	6
Math Requirement	3
TXCL 005—Textiles & Clothing in Contemporary Living	3
SOCY 001—Introduction to Sociology	3
PSYC 001—Introduction to Psychology	3
CHEM 001, 003 OR Physical and Biological Science Requirement	8
FDNT 005—Food & Nutr. of Individuals & Families OR NUTR 020	3
Health & Physical Education Requirements	4
Total	33

SOPHOMORE YEAR

Semester Hours

SPCH 007 or 001—Public Speaking	2-3
APDS 001—Fundamentals of Design OR APDS 004—Art History	3
FMCD 050—Decision Making in Family Living	3
History Requirement	6
ENGL 004—World Literature	3
Fine Arts or Philosophy	3
Supportive Courses	6
Electives	3
Total	29-30

JUNIOR YEAR

Semester Hours

FMCD 130—Family Patterns	3
FMCD 080—Household Equipment & Space Utilization OR HSAD 041—Family Housing OR TXCL 128—Fund. of Home Furnishings	3-4
FOOD 060—Meal Management OR FOOD 170—Food Economics	3
FMCD 180—Professional Seminar or elective	2
Supportive Courses	9
Electives	9
Total	29-30

SENIOR YEAR

Semester Hours

FMCD 132—The Child in the Family	3
FMCD 141—Personal and Family Finance	3
FMCD 143—Consumer Problems	3
FMCD 144—Resident Experience OR	
FMCD 145—Practicum	3
CLTH 100—Family Clothing OR	
TEXT 050—Consumer Textiles	3
Statistics	3
Supportive Courses	9
Electives	6
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Total	33

HOME ECONOMICS EDUCATION CURRICULUM

Students electing this curriculum may be registered in the College of Home Economics or in the College of Education.

The home economics education curriculum is designed for students who are preparing to teach home economics in the secondary schools. It includes study of each area of home economics and the supporting disciplines.

Fifteen hours of the total curriculum include an area of concentration which must be unified in content and which will be chosen by the student.*

FRESHMAN YEAR

(Semester)

	<i>I</i>	<i>II</i>
ENGL 001 or 021—Composition	3	..
SOCY 001—Introduction to Sociology	3	..
FMCD 005—Introduction to Family Living	3	..
FDNT 005—Food and Nutr. of Indiv. & Fam. OR		
NUTR 020—Elements of Nutrition	3	..
MATH requirement	3-4	..
PHED	1	1
PSYC 001—Introduction to Psychology .....	..	3
APDS 001—Fundamentals of Design .....	..	3
ENGL 003—World Literature .....	..	3
HLTH 005—Science and Theory of Health .....	..	2
TXCL 005—Textiles & Clothing in Contemp. Living .....	..	3
<hr/>		<hr/>
Total	16-17	15

*Area of Concentration: 15 semester hours

- A) Including maximum of two home economics courses, with the remainder of the 15 hours in supporting behavioral, physical and biological sciences, philosophy, special education, or human development.
- B) Of the 15 hours, 9 must be upper division.

SOPHOMORE YEAR

ENGL 004—World Literature	3	..
HIST	3	..
CHEM 001—General Chemistry	4	..
HSAD 040—Design and Furnishings in the Home		
OR HSAD 041—Family Housing	3	..
SPCH 001—Public Speaking	3	..
CLTH 010—Principles and Methods of Clothing		
Design (or CLTH 011) .....	..	2
HIST .....	..	3
CHEM 003—General Chemistry .....	..	4
FOOD 010—Scientific Principles of Food .....	..	3
Fine Arts or Philosophy Requirement .....	..	3
FMCD 050—Decision Making in Family Living .....	..	3
Total	16	18

JUNIOR YEAR

EDUC 110—Human Development and Learning	6	..
FOOD 060—Meal Management	3	..
FMCD 141—Personal and Family Finance or alternative	3	..
Area of concentration *	3	..
FMCD 132—The Child in the Family OR		
EDHD 107—Growth and Development in Early Childhood	..	3
ECON 037—Fundamentals of Economics .....	..	3
EDSE 125—Problems in Teaching Home Economics .....	..	3
ZOOL 001 or MICB 001 .....	..	4
Area of concentration *	..	3
Total	15	16

SENIOR YEAR

	Semester	
	I	II
EDSE 140—Curriculum, Instruction & Observation ¹⁰	3	..
EDSE 145—Principles & Methods of Secondary Education ..	3	..
EDSE 148—Teaching Secondary Vocational Home		
Economics	8	..
FMCD 144—Resident Experience in Home Management OR		
FMCD 145—H. M. Practicum	3	..
FMCD 060—Family Relations OR		
SOCY 164—The Family & Society .....	..	3
EDUC 111—Foundations of Education .....	..	3
Area of concentration .....	..	9
HOEC 180—Professional Seminar ¹¹ .....	..	2
Total	17	17

*Area of Concentration: 15 semester hours

A) Including maximum of two home economics courses, with the remainder of the 15 hours in supporting behavioral, physical and biological sciences, philosophy, special education, or human development.

B) Of the 15 hours, 9 must be upper division.

¹⁰ Student teaching block

¹¹ Required only of students registered in College of Home Economics.

DEPARTMENT OF HOUSING AND APPLIED DESIGN

The fundamental purpose of programs of concentration in this area is to provide a broad, general education in addition to the individually and professionally oriented instruction in design. Dependent upon elected allied areas of study, professional opportunities include: design of interiors, fashions, advertising, home furnishings; illustration of fashions and interiors; sales promotion or retailing of wearing apparel, homes and home furnishings; fashion or home furnishings journalism; housing consultant, urban development programs.

ADVERTISING DESIGN CURRICULUM

FRESHMAN YEAR	Semester	
	I	II
ENGL 001 or 021—Composition	3	..
ENGL 003—World Literature .....	..	3
Math Requirement	3-4	..
Science Requirement .....	..	3-4
SPCH 007 or 001—Public Speaking	2-3	..
ART 016—Drawing I	3	..
HLTH 005—Science and Theory of Health	2	..
Physical Education	1	1
EDIN 001—Mechanical Drawing .....	..	3
FDNT 005—Food and Nutrition of Individuals and Families or NUTR 020—Elements of Nutrition .....	..	3
APDS 001—Fundamentals of Design	3	..
APDS 002—Design II .....	..	3
Total	17-19	16-17
SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
PSYC 001—Introduction to Psychology	3	..
ECON 037—Fundamentals of Economics .....	..	3
Science Requirement .....	..	3-4
FMCD 050—Decision Making in Family Living .....	..	3
TXCL 005—Textiles and Clothing in Contemporary Living	3	..
APDS 010—Presentation Techniques	3	..
APDS 011—Action Drawing—Fashion Sketching .....	..	3
APDS 030—Silk Screen Printing .....	..	3
APDS 038—Photography	2	..
APDS 003—Design III—3-Dimensional Design	3	..
Total	17	15-16

JUNIOR YEAR	Semester	
	I	II
History Requirement	3	3
SOCY 001—Sociology of American Life	3	..
ART 178—Twentieth Century Art .....	..	3
EDIN 034—Graphic Arts I	3	..
APDS 120—Fashion Illustration	3	..
APDS 130—Typography and Lettering	3	..
APDS 132—Advertising Layout .....	..	3
APDS 136—Display Design .....	..	3
Restricted Elective .....	..	3
Total	15	15

SENIOR YEAR		
PHIL 147—Philosophy of Art	3	..
APDS 134, 135—Advanced Problems in Advertising Design	3	3
APDS 138—Advanced Photography .....	..	2
APDS 180—Professional Seminar .....	..	2
Restricted Electives	3	3
Free Electives	6	3-4
Total	15	13-14

COSTUME CURRICULUM

FRESHMAN YEAR	Semester	
	I	II
ENGL 001 or 021—Composition .....	..	3
Fine Arts Requirement	3	..
SOCY 001—Sociology of American Life	3	..
ART 016—Drawing I .....	..	3
HLTH 005—Science and Theory of Health	2	..
Physical Education	1	1
Science Requirement .....	..	3-4
TXCL 005—Textiles and Clothing in Contemporary Living ..	3	..
APDS 001—Fundamentals of Design	3	..
APDS 002—Design II .....	..	3
APDS 010—Presentation Techniques .....	..	3
Total	15	16-17

SOPHOMORE YEAR

ENGL 003, 004—World Literature	3	3
Math Requirement	3-4	..
Science Requirement .....	..	3-4
SPCH 007 or 001—Public Speaking .....	..	2-3
FDNT 005—Food and Nutrition of Individuals and Families or NUTR 020—Elements of Nutrition	3	..
FMCD 050—Decision Making in Family Living .....	..	3
APDS 003—Design III—3-Dimensional Design	3	..
APDS 011—Action Drawing—Fashion Sketching	3	..
APDS 020—Introduction to Fashion Design .....	..	3
Total	15-16	14-16

JUNIOR YEAR	Semester	
	I	II
PSYC 001—Introduction to Psychology	3	..
History Requirement	3	3
ART 061—History of Art	3	..
ECON 037—Fundamentals of Economics .....	..	3
APDS 038—Photography	2	..
APDS 120—Fashion Illustration	3	..
APDS 121—Fashion Design and Illustration .....	..	3
APDS 130—Typography and Lettering .....	..	3
Restricted Electives	3	3
Total	17	15

SENIOR YEAR		
APDS 122, 123—Advanced Costume	2	2
APDS 132—Advertising Layout	3	..
APDS 136—Display Design .....	..	3
APDS 180—Professional Seminar .....	..	2
Restricted Electives	6	3
Free Electives	4-6	4-5
Total	15-17	14-15

CRAFTS CURRICULUM

FRESHMAN YEAR	Semester	
	I	II
ENGL 001 or 021—Composition	3	..
ENGL 003—World Literature .....	..	3
History Requirement	3	..
SOCY 001—Sociology of American Life .....	..	3
HLTH 005—Science and Theory of Health	2	..
Physical Education	1	1
FDNT 005—Food and Nutrition of Individuals and Families or NUTR 020—Elements of Nutrition .....	..	3
TXCL 005—Textiles and Clothing in Contemporary Living	3	..
APDS 001—Fundamentals of Design	3	..
APDS 002—Design II .....	..	3
CRAF 001—Craft Fundamentals and Materials .....	..	3
Total	15	16

SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
Math Requirement	3-4	..
Science Requirement .....	..	3-4
PSYC 001—Introduction to Psychology .....	..	3
SPCH 007 or 001—Public Speaking .....	..	2-3
EDIN 002—Woodworking I	3	..
APDS 003—Design 003—3-Dimensional Design	3	..
APDS 010—Presentation Techniques	3	..
APDS 011—Action Drawing—Figure Sketching .....	..	3
CRAF 041—Decorative Textiles .....	..	3
Total	15-16	14-16

JUNIOR YEAR	Semester	
	I	II
PHIL 147—Philosophy of Art	3	..
Science Requirement	3-4	..
ECON 037—Fundamentals of Economics .....	..	3
FMCD 050—Decision Making in Family Living .....	..	3
APDS 030—Silk Screen Printing	3	..
APDS 038—Photography .....	..	2
CRAF 020—Ceramics—Materials and Processes	3	..
CRAF 120—Advanced Ceramics I .....	..	3
CRAF 030—Metalry I .....	..	3
CRAF 040—Weaving	3	..
Free Elective .....	..	3
Total	15-16	17

SENIOR YEAR	Semester	
	I	II
History Requirement	3	..
APDS 180—Professional Seminar .....	..	2
CRAF 121—Advanced Ceramics II	3	..
CRAF 130—Advanced Metalry I	2	..
CRAF 190—Individual Problems in Crafts	2-3	3-4
Restricted Electives	6	3
Free Electives .....	..	4-6
Total	16-17	12-15

HOUSING CURRICULUM

FRESHMAN YEAR	Semester	
	I	II
SOCY 001—Sociology of American Life	3	..
SPCH 001 or 007—Public Speaking	2-3	..
FDNT 005—Food and Nutrition of Individuals and Families	3	..
TXCL 005—Textiles & Clothing in Contemporary Living	3	..
APDS 001—Fundamentals of Design	3	..
Physical Education	1	1
ENGL 001 or 021—Composition .....	..	3
PSYC 001—Introduction to Psychology .....	..	3
HLTH 005—Science and Theory of Health .....	..	2
CLTH 010—Principles and Methods of Clothing Design .....	..	2
APDS 002—Design II .....	..	3
APDS 010—Presentation Techniques .....	..	3
Total	15-16	17

SOPHOMORE YEAR	Semester	
	I	II
ENGL 003, 004—World Literature	3	3
Science Requirement	3-4	..
PSYC 021—Social Psychology .....	..	3
FMCD 050—Decision Making in Family Living	3	..
TEXT 050—Consumer Textiles .....	..	3
APDS 003—Design III—3-Dimensional Design	3	..
HSAD 040—Design and Furnishings in the Home	3	..
HSAD 041—Family Housing .....	..	3
HSAD 046—Materials of Interior Design .....	..	3
Total	15-16	15

JUNIOR YEAR		
Math Requirement	3	..
Science Requirement	3-4	..
History Requirement	3	..
SOCY 071—Dynamics of Social Interaction .....	..	3
Fine Arts Requirement .....	..	3
FOOD 060—Meal Management	3	..
FMCD 060—Family Relations or alternative .....	..	3
HSAD 142—Space Development	3	..
HSAD 143—Interior Design I .....	..	3
Restricted elective .....	..	3
Total	15-16	15

SENIOR YEAR		
History Requirement	3	..
ECON 037—Fundamentals of Economics .....	..	3
ART 071—Masterpieces of Architecture .....	..	3
FMCD 144—Home Management Residence	3	..
FMCD 130—Family Patterns or alternative	3	..
FMCD 132—The Child in the Family .....	..	3
Restricted Electives	3	3
Free Electives	3	3
Total	15	15

INTERIOR DESIGN CURRICULUM

FRESHMAN YEAR	Semester	
	I	II
ENGL 001 or 021—Composition	3	..
ENGL 003—World Literature .....	..	3
SOCY 001—Sociology of American Life	3	..
History Requirement .....	..	3
Math Requirement .....	..	3-4
HLTH 005—Science and Theory of Health	2	..
Physical Education	1	1
EDIN 001—Mechanical Drawing	2	..
TXCL 005—Textiles and Clothing in Contemporary Living .....	..	3
NUTR 020—Elements of Nutrition	3	..
APDS 001—Fundamentals of Design	3	..
APDS 002—Design II .....	..	3
Total	17	16-17
SOPHOMORE YEAR		
ENGL 004—World Literature	3	..
PSYC 001—Introduction to Psychology	3	..
Science Requirement .....	..	3-4
ECON 037—Fundamentals of Economics .....	..	3
SPCH 007 or 001—Public Speaking	2-3	..
FMCD 050—Decision Making in Family Living	3	..
TEXT 050—Consumer Textiles .....	..	3
APDS 003—Design III—3-Dimensional Design	3	..
APDS 038—Photography .....	..	2
HSAD 046—Materials of Interior Design .....	..	3
APDS 010—Presentation Techniques	3	..
Total	17-18	14-15
JUNIOR YEAR		
History Requirement	3	..
PHIL 147—Philosophy of Art .....	..	3
TEXT 153—International Textiles .....	..	2
HSAD 140—Period Homes and Their Furnishings	3	..
HSAD 142—Space Development	3	..
HSAD 143—Interior Design I .....	..	3
Restricted Electives	3	3
Free Electives	3	3
Total	15	14

SENIOR YEAR	<i>Semester</i>	
	<i>I</i>	<i>II</i>
Science Requirement	3-4	..
HSAD 141—Contemporary Developments in Architecture, Interiors, Furnishings .....	..	3
HSAD 144—Interior Design II	3	..
HSAD 145—Professional Aspects of Interior Design .....	..	3
HSAD 146—Interior Design III .....	..	4
HSAD 147—Interior Design IV .....	..	4
Restricted Electives	3	..
Free Electives	6	..
	<hr/>	<hr/>
Total	15-16	14

Course Offerings

The University reserves the right to withdraw or discontinue any course for which an insufficient number of registering students warrant offering the course. In such an event, no fee will be charged for transfer to another course.

Courses are designated by numbers as follows:

001 to 099: Courses for undergraduates.

100 to 199: Courses for advanced undergraduates and graduates.
(Not all courses numbered 100 to 199 may be taken for graduate credit.)

200 to 299: Courses for graduates only.

399: Graduate research.

A course with a single number extends through one semester. A course with a double number extends through two semesters.

Courses not otherwise designated are lecture courses. The number of credit hours is shown by the Arabic numeral in parentheses after the title of the course.

A separate schedule of courses is issued each semester, giving the hours, places of meeting, and other information required by the student in making out his program. Students obtain these schedules shortly before they register.

FOOD, NUTRITION, AND INSTITUTION ADMINISTRATION

Professor: PRATHER.

Associate Professors: AHRENS, BUTLER.

Assistant Profesors: BANGS, EHEART, ZALLEN.

Instructors: HARWOOD, KNIGHTON, NIFFENEGGER, VANEGMOND.

FOOD

FDNT 005. FOOD AND NUTRITION OF INDIVIDUALS AND FAMILIES. (3)

First and second semesters. Two lectures and one two-hour laboratory period a week. Consent of instructor. A study of food in contemporary living. The economic, social and esthetic implications of food as well as its nutritive value. Selection and use of food in relation to eating habits, health, and well-being of the individual. Survey of meal preparation and service applied to family situations.

FDNT 050. PROFESSIONAL ORIENTATION. (1)

Second semester. A series of lectures introducing the student to the broad field of careers in food, nutrition, dietetics, and institution administration. Includes trends, role of related sciences, educational and personal requirements, ethics, and opportunities in each professional area.

FOOD 010. SCIENTIFIC PRINCIPLES OF FOOD. (3)

First and second semesters. Two lectures and one two-hour laboratory period a week. Prerequisites, FDNT 005 or NUTR 020, and CHEM 001 or concurrent. Study of basic scientific principles as applied to food preparation processes. For non-departmental majors.

FOOD 052, 053. SCIENCE OF FOOD PREPARATION. (3, 3)

First and second semesters. One lecture and two two-hour laboratory periods a week. Prerequisites, FDNT 005, CHEM 031 or concurrent. Composition and structure of food with study of the fundamental principles involved in food preparation. Especially designed for departmental majors.

FOOD 060. MEAL MANAGEMENT. (3)

First and second semesters. Two lectures and one three-hour laboratory a week. Prerequisites, FOOD 010 or 052. Retail selection of food commodities in relation to levels of spending; management of family meals through organization of available resources.

NUTRITION

(See FDNT 005)

NUTR 020. ELEMENTS OF NUTRITION. (3)

First and second semesters. Three lectures per week. Fundamentals of human nutrition. Nutrient requirements related to changing individual and family needs. For non-departmental majors.

FOOD

For Advanced Undergraduates and Graduates

FOOD 130. SPECIAL PROBLEMS IN FOODS. (2-3)

First or second semester. Prerequisites, FOOD 152 and consent of instructor. Individual selected problems in the area of food science.

FOOD 152. ADVANCED FOOD SCIENCE. (3)

First semester. Three lectures per week. Prerequisites, CHEM 031, 033, FOOD 052, 053, CHEM 161 or concurrently. Chemical and physical properties of food as related to consumer use in the home and institutions.

FOOD 153. EXPERIMENTAL FOOD SCIENCE. (3)

Second semester. One lecture, two laboratories per week. Prerequisite, FOOD 152 or equivalent. Individual and group laboratory experimentation as an introduction to methods of food research.

FOOD 170. ECONOMICS OF FOOD CONSUMPTION. (3)

First and second semesters. Prerequisites, Economics and consent of the instructor. Interrelations of food, population and economic progress; trends in food-consumption patterns; world and local food problems.

FOOD 180. FOOD ADDITIVES. (3)

Alternate years. Prerequisite, FOOD 152 or equivalent. Effects of intentional and incidental additives on food quality, nutritive value and safety. FDA approved additives, GRAS substances, pesticide residues, mycotoxins, antibiotics, and hormones will be reviewed.

NUTRITION**NUTR 114. NUTRITION FOR HEALTH SERVICES. (3)**

First and second semester. Prerequisite, NUTR 020, CHEM 001, 003 or equivalent. A study of nutritional status and the effect of food habits and food consumption on family health. Nutritional requirements for individuals in different stages of development. Techniques and procedures for the application of nutrition knowledge with consideration of various economic levels and social backgrounds. For graduate nurses, dietitians, health teachers, and social workers.

NUTR 121. SCIENCE OF NUTRITION. (3)

Second semester. Prerequisites, ZOOL 1, CHEM 31, 33 or concurrently. Two lectures and one two-hour laboratory. An understanding of the chemical and physiological utilization of nutrients present in food as related to individual human nutritional status; includes digestion and absorption, requirements, deficiencies.

NUTR 124. ADVANCED NUTRITION. (3)

First semester. Prerequisites, consent of department; ZOOL 001; CHEM 161, 163 or concurrently. Two lectures and one two-hour laboratory. The progress of nutrition as found in the results of current research, with emphasis on interpretation and application.

NUTR 125. THERAPEUTIC NUTRITION. (3)

Second semester. Two lectures and one laboratory period a week. Prerequisites, NUTR 121, 124. Modifications of the normal adequate diet to meet human nutritional needs in pathological conditions.

NUTR 130. SPECIAL PROBLEMS IN NUTRITION. (2-3)

First or second semester. Prerequisites, NUTR 121 and consent of instructor. Individual selected problems in the area of human nutrition.

NUTR 140. MATERNAL, INFANT AND CHILD NUTRITION. (2)

Two lectures per week. Prerequisite, course in basic nutrition. Nutritional needs of the mother, infant and child and the relation of nutrition to physical and mental growth.

NUTR 145. INTERNATIONAL NUTRITION. (2)

Two lectures a week. Prerequisite, course in basic nutrition. Nutritional status of world population and local, national, and international, programs for improvement.

NUTR 150. HISTORY OF NUTRITION. (2)

Two lectures per week. Prerequisite, course in basic nutrition. A study of the development of the knowledge of nutrition and its interrelationship with social and economic developments.

*For Graduates***FOOD¹²****FOOD 200. ADVANCED EXPERIMENTAL FOOD. (3-5)**

Second semester. Two lectures and three laboratory periods a week. Selected readings of literature in experimental foods. Development of individual problem.

FOOD 204. NUTRITIONAL AND QUALITY EVALUATION OF FOOD. (3)

First semester. Prerequisite, FOOD 152 or consent of instructor. Effects of production, processing, marketing, storage, and preparation on nutritive value and quality of foods.

FOOD 210. READINGS IN FOOD (3)

Second semester. Prerequisite FOOD 152 or consent of instructor. A critical survey of the literature of recent developments in food research.

FOOD 220. SEMINAR. (1-2)

First and second semesters. Reports and discussions of current research in foods.

FOOD 240. FOOD ENZYMES. (3)

First semester, alternate years. Two lectures and one three-hour laboratory. Prerequisite, FOOD 152 or equivalent. The classification and behavior of naturally occurring and added enzymes in food; includes the effects of temperature, pH, radiation, moisture, etc., on enzyme activity.

FOOD 399. RESEARCH. (6)

First and second semesters. Credit in proportion to work done and results accomplished. Investigation in some phases of food which may form the basis for a thesis.

NUTRITION**NUTR 208. RECENT PROGRESS IN HUMAN NUTRITION. (3)**

Second semester. Recent developments in the science of nutrition with emphasis on the interpretation of these findings for application in health and disease. Aids for the dietitian in creating a better understanding of nutrition among patients, students of graduate status and personnel, such as those in the dental and medical professions.

NUTR 210. READINGS IN NUTRITION. (3)

First and second semesters. Reports and discussions of significant nutritional research and investigation.

NUTR 211. PROBLEMS IN NUTRITION. (3-5)

Second semester. Experience in a phase of nutrition research which is of interest to the student. Use of experimental animals, human studies and extensive and critical study of research methods, techniques or data of specific projects.

NUTR 212. NUTRITION FOR COMMUNITY SERVICES. (3)

First semester. Application of the principles of nutrition to various community problems of specific groups of the public. Students may select problems for independent study.

NUTR 220. SEMINAR. (1)

First and second semesters. Reports and discussions of current research in nutrition.

NUTR 221. INTERMEDIARY METABOLISM IN NUTRITION (3)

Second semester. Prerequisites, CHEM 161, 163 or equivalent. The major routes of carbohydrate, fat, and protein metabolism with particular emphasis on metabolic shifts and their detection and significance in nutrition.

²²Prerequisite for all 200 courses in Food and Nutrition, consent of department.

NUTR 285. HUMAN NUTRITIONAL STATUS. (3)

First semester, alternate years. Methods of appraisal of human nutritional status, to include dietary, biochemical and anthropometric techniques.

NUTR 399. RESEARCH. (6)

First and second semesters. Credit in proportion to work done and results accomplished. Investigation in some phase of nutrition which may form the basis of a thesis.

For Advanced Undergraduates and Graduates

INSTITUTION ADMINISTRATION

IADM 130. SPECIAL PROBLEMS IN FOOD SERVICE. (2-3)

First or second semesters. Prerequisites, senior standing and consent of instructor. Individual selected problems in the area of food service.

IADM 140. PRACTICUM IN INSTITUTION ADMINISTRATION. (3)

Prerequisite, 5 credits in IADM and consent of department. In-service training and practical experience, totaling at least 240 hours, in an approved food service.

IADM 150. FOOD SERVICE ORGANIZATION AND MANAGEMENT. (2)

First semester. Introduction to the food services; principles of organization, management, financial control, and technical operations. Records, reports, and organization charts included.

IADM 151. FOOD PURCHASING AND COST CONTROL. (3)

First semester. Prerequisite, FOOD 052, introductory accounting recommended. Food selection and the development of integrated purchasing programs. Standards of quality; the marketing distribution system; managerial cost control.

IADM 152. QUANTITY FOOD PRODUCTION. (3)

Second semester. Two hours of lecture and one three-hour laboratory a week. Prerequisites, FOOD 052, or consent of instructor. Scientific principles and procedures employed in food preparation in large quantity. Laboratory experience in management techniques in quantity food production and service.

IADM 153. FOOD SERVICE PERSONNEL ADMINISTRATION. (2)

Second semester. Prerequisite, IADM 150. Principles of personnel administration in food services; emphasis on personnel selection; supervision and training; job evaluation, wage and payroll structure, current labor regulations, and interpersonal relationships and communications.

IADM 154. SCHOOL FOOD SERVICE. (3)

Two lectures and one morning a week for field experience in a school food service. Prerequisites: FOOD 10, or 52, 53, and NUTR 121, or consent of instructor. Study of organization and management, menu planning, food purchasing, preparation, service, and cost control in a school lunch program.

IADM 155. FOOD SERVICE EQUIPMENT AND PLANNING. (3)

First semester. Two lectures and one two-hour laboratory a week. Prerequisite, consent of instructor. Equipment design, selection, maintenance and efficient layout; relation of the physical facility to production and service. Field trips.

IADM 181, 182. ADMINISTRATIVE DIETETICS. (3,3)

First semester and second semester. (Open only to students accepted into and participating in the U.S. Army Dietetic Internship program at Walter Reed General Hospital.) Application of management theory through guided experience in all aspects of hospital dietary department administration.

IADM 183. APPLIED DIET THERAPY. (3)

First semester. (Open only to students accepted into and participating in the U.S. Army Internship program at Walter Reed General Hospital.) Application of principles of normal and therapeutic nutrition in the total medical care and instruction of patients.

*For Graduates***IADM 200. FOOD SERVICE ADMINISTRATION. (3)**

First or second semester. Principles of organization and management related to a food system. Control of resources through the use of quantitative methods. Administrative decision-making, and personnel policies and practices.

IADM 210. READINGS IN FOOD ADMINISTRATION. (3)

First or second semester. Reports and discussion of significant research and development in the area of food administration.

IADM 235. COMPUTER APPLICATION IN FOOD SERVICE. (3)

Second semester. Prerequisite, IADM 200 or equivalent. The use of automatic data processing and programming for the procurement and issuing of food commodities, processing of ingredients, menu selection, and labor allocations.

IADM 245. SANITATION AND SAFETY IN FOOD SERVICE. (3)

Second semester. Prerequisite, MICB 001. Principles and practices of sanitation and safety unique to the production, storage and service of food in quantity; includes current legislation.

IADM 255. EXPERIMENTAL QUANTITY FOOD PRODUCTION. (3)

First semester. Two lectures and one three-hour laboratory. Prerequisites, IADM 152 and FOOD 153 or equivalents. Application of experimental methods to quantity food production; recipe development and modification; relationship of food quality to production methods.

IADM 399. RESEARCH. (1-6)

First and second semesters. Credit in proportion to work done and results accomplished. Investigation in some phases of institution administration which may form the basis on a thesis.

TEXTILES AND CLOTHING

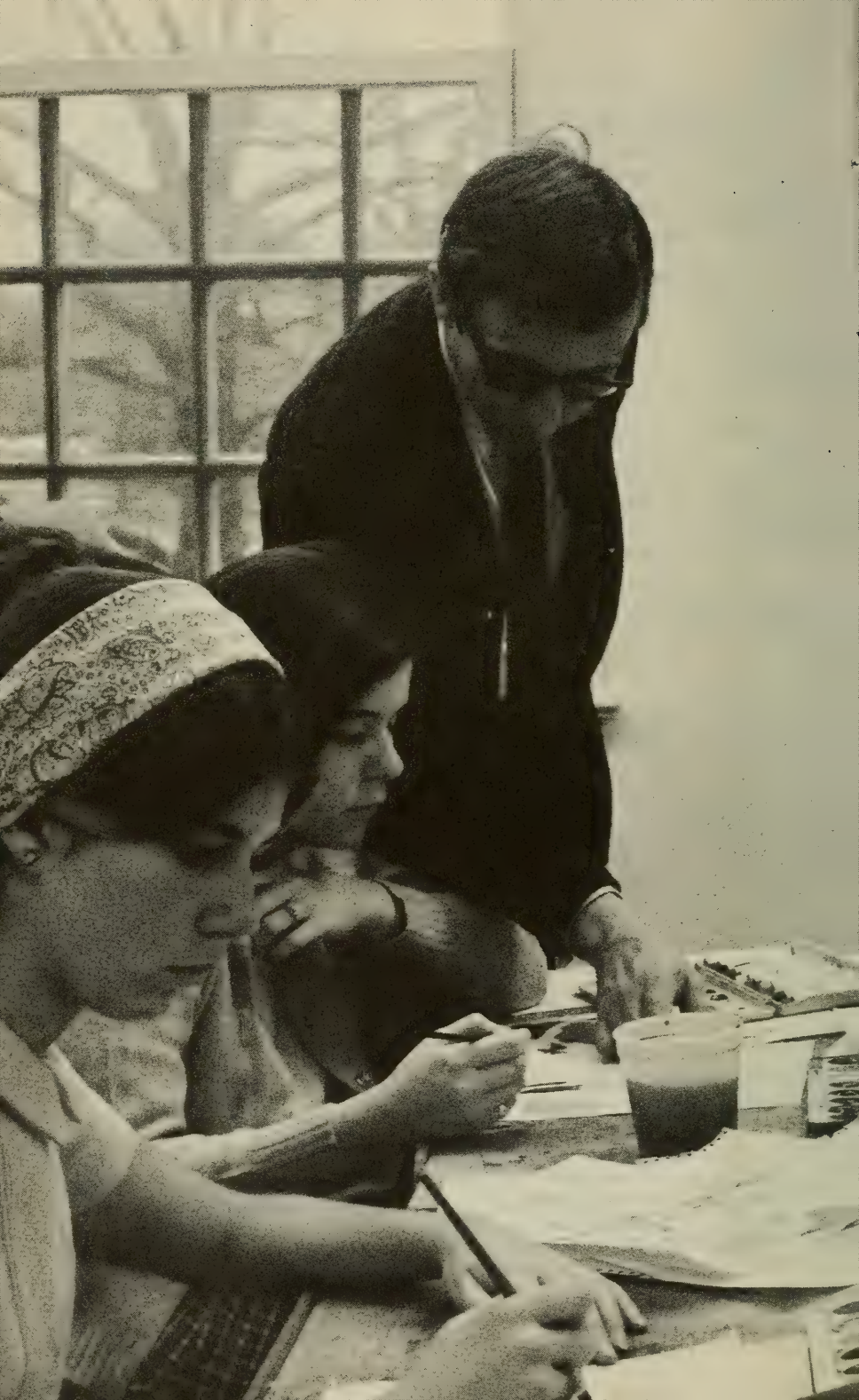
Professor and Chairman:

Assistant Professors: HEAGNEY, WILBUR.

Instructors: EYLER, PLEDGER, SOUTHER.

TXCL 005. TEXTILES AND CLOTHING IN CONTEMPORARY LIVING. (3)

First and second semesters. Three lecture-discussion periods a week. Comparative analysis of the significance of fashions and fabrics to individuals and groups, in terms of their physical, psychological, and social needs. Application of current technology to the choice and use of apparel and home furnishing textiles toward increasing satisfactions in changing modes of living.



*For Advanced Undergraduates and Graduates***TXCL 101. FASHION PROMOTION AND COORDINATION. (3)**

Second semester. Two lectures and one laboratory period a week. Prerequisites, TXCL 126; SPCH 115 or 117. Analysis of fashion media; industry publications, magazines, newspapers, radio, TV; merchandise displays and fashion shows. Role of the stylist.

TXCL 110. FIELD EXPERIENCE IN TEXTILES AND CLOTHING. (3)

First semester or summer school. Prerequisite, senior standing in department. Supervised and coordinated training-work program in cooperation with agencies and organizations.

TXCL 126. FUNDAMENTALS OF FASHION. (3)

Second semester. Prerequisite, CLTH 120. Fashion history: current fashions, how to interpret and evaluate them; fashion show techniques; fashion promotion. The course includes oral and written reports, group projects, panel discussions and field trips.

TXCL 128. FUNDAMENTALS OF HOME FURNISHINGS. (3)

First and second semesters. Three laboratory periods a week. Prerequisites, TXCL 005, CLTH 010, or consent of instructor. Selection of fabrics for home and institutional furnishings; care and repair of such furnishings; custom construction of slip covers, draperies, bedspreads; refinishing and upholstering furniture.

TEXTILES**TEXT 050. CONSUMER TEXTILES. (3)**

Second semester. Two lectures and one laboratory period a week. Prerequisite, TXCL 005 or consent of instructor. (Cannot be used as prerequisite for TEXT 150.) Problems of the consumer in textile selection, purchase, and care as related to service and esthetic features of fibers, yarns, and fabric construction and finish.

TEXT 055. ELEMENTS OF TEXTILES. (3)

First semester. Two lectures and one laboratory period a week. Prerequisite, TXCL 005, CHEM 001, 003. Intensive study of the physical and chemical properties of fibers, of yarn and fabric construction, of color and design application, and of finishing. Evaluation of sources of consumer information on legislation protecting textile consumers. Economic factors affecting textile consumption.

*For Advanced Undergraduates and Graduates***TEXT 102. TEXTILE TESTING. (3)**

Second semester. Three laboratory periods a week. Prerequisite, TEXT 055. The theory of textile testing methods, the repeated use of physical and chemical testing, interpretation of data, and presentation of findings.

TEXT 150. ADVANCED TEXTILES. (3)

First semester. One lecture and two laboratory periods a week. Prerequisite, TEXT 055. An intensive study of textiles from the fiber to the finished fabric, from the producer to the consumer. Analysis of fabric construction and serviceability features.

TEXT 153. INTERNATIONAL TEXTILES. (2)

First semester. Two lectures a week. Prerequisite, TXCL 005 or consent of instructor. Study of historic and contemporary fibers and laces with analysis of designs and techniques of decorating fabrics; relationship of textiles to the esthetic and developmental cultures of society.

CLOTHING**CLTH 010. PRINCIPLES AND METHODS OF CLOTHING DESIGN. (2)**

First and second semesters. Two lecture periods a week. Basic construction and fitting techniques of apparel demonstrated in relation to interpretation and use of commercial patterns. Esthetic and economic aspects as interrelated.

CLTH 011. EXPERIMENTAL CLOTHING DESIGN. (2)

First and second semesters. Two laboratory periods a week. Prerequisite, CLTH 010 or concurrent registration. Application of principles and methods of clothing construction with emphasis on management and analysis of values to be achieved.

CLTH 021. PATTERN DESIGN. (3)

First and second semesters. Three two-hour laboratory periods a week. Prerequisites, CLTH 010 and consent of department. Pattern study, figure analysis and pattern alteration, development and adaptation of individual basic pattern, creation of original designs.

*For Advanced Undergraduates and Graduates***CLTH 100. FAMILY CLOTHING. (3)**

First semester in alternate years. One lecture and two laboratory periods a week. Prerequisites, TXCL 005; CLTH 010, 011; or equivalent. Clothing the family; analysis of needs of family members in various stages of the life cycle; individual and family budgets; problems in selection and/or construction of wardrobe items.

CLTH 120. DRAPING. (3)

First semester. Two laboratory periods a week. Prerequisite, CLTH 010, and CLTH 021. Demonstrations and practice in creating costumes in fabrics and on individual dress forms; modeling of garments for class criticism.

CLTH 122. TAILORING. (2)

First and second semesters. Two laboratory periods a week. Prerequisite, CLTH 021. Construction of tailored garments requiring professional skill.

CLTH 127. APPAREL DESIGN. (3)

Second semester. One lecture and two laboratory periods a week. Prerequisite, CLTH 120. The art of costuming; trade and custom methods of clothing design and construction; advanced work in draping, pattern design and/or tailoring, with study of the interrelationship of these techniques.

*For Graduates***TEXT 200. SPECIAL STUDIES IN TEXTILES. (2-4)**

First or second semester. Summer session. Advanced inquiry into uses, care, types and/or performance of textile materials, either contemporary or historic depending on interest of students; compilation of data through testing, surveys, museum visits and/or field trips; writing of technical reports.

CLTH 220. SPECIAL STUDIES IN CLOTHING. (2-4)

First and second semester. Special areas of clothing are selected according to interest of student; consumer, design, functional aspects, and/or evaluation and analysis studies are made of those areas. Reports may be written, oral, or by group presentation.

TXCL 230. SEMINAR. (1)

First and second semesters. The breadth and limit of the field of textiles and clothing are investigated; annotated bibliography is developed; one oral report is presented.

TXCL 232. ECONOMICS OF TEXTILES AND CLOTHING. (3)

Second semester. Study of interrelationship of developments in production, distribution and consumption of textiles and clothing affecting consumers and the market. Analysis of consumption trends as related to patterns of family living and population changes.

TXCL 233. SYNTHESSES OF BEHAVIORAL SCIENCE CONCEPTS IN TEXTILES AND CLOTHING. (3)

Second semester. Prerequisites, PSYC 021 and/or consent of department. Analysis and interpretation of interdisciplinary research methods and findings with reference to behavioral aspects of textiles and clothing. Consideration given to measurement and relation of clothing interest and behavior to attitudes, values, roles, and social status groupings.

TXCL 399. RESEARCH. (1-6)

First and second semesters. A research problem is selected by the student; thesis for partial fulfillment of the Master of Science degree is written.

DEPARTMENT OF FAMILY AND COMMUNITY DEVELOPMENT

FMCD 005. INTRODUCTION TO FAMILY LIVING. (3)

Interrelations of the individual and his family through the various stages of the family life cycle; underlying principles of guidance of children as applied to home situations.

FMCD 050. DECISION MAKING IN FAMILY LIVING. (3)

First and second semesters. (Designed for second, third, or fourth semester students.) Decision making in relation to family values, philosophies, goals, and resources, and general socio-economic conditions.

FMCD 060. FAMILY RELATIONS. (3)

First and second semesters. Prerequisites, PSYC 001; FMCD 005. Study of factors influencing establishment and maintenance of satisfying interpersonal relations throughout the family life cycle as affected by management in the home.

FMCD 080. HOUSEHOLD EQUIPMENT AND SPACE UTILIZATION. (4)

2 lectures, 2 laboratory sessions. Study of household equipment and space utilization as they affect family members in task performance. Emphasis is on the consumer's viewpoint, supported by laws of the physical sciences.

For Advanced Undergraduates and Graduates

FMCD 130. FAMILY PATTERNS. (3)

A study of family patterns within the sub-cultures of America and various other cultures. Emphasis will be given to those patterns and life styles which evolve as adaptations to cultural demands.

FMCD 131. FAMILY CRISES AND DISINTEGRATION. (3)

Prerequisite, PSYC 001. A study of significant changes within the family setting which ultimately require major adjustments in inter-personal and intra-personal relations.

FMCD 132. THE CHILD IN THE FAMILY. (3)

First and second semesters. Three lectures. Prerequisite, PSYC 001. Study of the child from prenatal stage through adolescence, with emphasis on responsibility for guidance in the home. Biological and psychological needs as they affect the child's relationship with his family and peers.

FMCD 141. PERSONAL AND FAMILY FINANCE. (3)

Study of individual and family finances with particular emphasis upon financial planning, savings, insurance, investments, income taxes and use of credit.

FMCD 143. CONSUMER PROBLEMS. (3)

Prerequisite, FMCD 050. Consumer practices of American families. Merchandising practices as they affect the consumer. Organizations and laws in the interest of the consumer.

FMCD 144. RESIDENT EXPERIENCE IN HOME MANAGEMENT. (3)

First and second semesters. Prerequisites, FMCD 050; 080, 141, or 143; FOOD 060; or equivalent. Residence from four to nine weeks in the home management center. Experience in planning, coordinating, and participating in the activities of a household, composed of a faculty member, a group of students, and possibly an infant on a part-time basis. Students not living in dormitories are billed at the rate of \$5.00 a week for a room in the Home Management Residence. A charge of \$40.00 for food and supplies is assessed each student. Dormitory residents will be refunded a prorated amount for meals.

FMCD 145. PRACTICUM WITH FAMILIES/CHILDREN/HOME MANAGEMENT. (3)

A planned supervised experience with families through participation and observation will be arranged for each student. The practicum is designed to increase the student's awareness and understanding of the dynamics of family resource management.

FMCD 146. LIVING EXPERIENCES WITH FAMILIES. (3-6)

- a. Domestic Intercultural
- b. International Intercultural

Prerequisites, FMCD 080, ANTH 001, FMCD 050; optional, language competence. An individual experience in living with families of a sub-culture within the U.S. or with families of another country, participating in family and community activities. A foreign student may participate and live with an American family.

FMCD 170. COMMUNICATION SKILLS AND TECHNIQUES IN HOME ECONOMICS. (3)

First and second semesters. Principles and techniques for professional demonstration and presentation of home economics and its related areas with selected experiences in television, radio, creative writing, and photography.

FMCD 180. PROFESSIONAL SEMINAR. (2)

Survey of professional opportunities, responsibilities and trends in each departmental area of emphasis. Concentration will be on the development of personal qualities and professional ethics essential for effective occupational performance.

FMCD 185. INTRODUCTION TO FAMILY COUNSELING. (3)

Prerequisites, PSYC 001 and 005; FMCD 005 and 131. Basic principles of counseling and its effect on family action.

FMCD 188. LEGAL ASPECTS OF FAMILY PROBLEMS. (3)

Laws and legal involvement that directly affect specific aspects of the family: adoption, marriage, estate planning, property rights, wills, etc. Emphasis will be given to the involvement of a professional lawyer; principles and interpretation of the law.

FMCD 190. SPECIAL TOPICS. (1-3)

- a. Family studies
- b. Community studies
- c. Management and consumer studies

For Graduates

Consult Dean, College of Home Economics

HOME ECONOMICS EDUCATION¹³**EDSE 125. PROBLEMS IN TEACHING HOME ECONOMICS. (3)**

First and second semesters. A study of the managerial aspects of teaching and administering a homemaking program; the physical environment, organization and sequence of instructional units; resource materials; evaluation; home projects.

EDSE 126. EVALUATION OF HOME ECONOMICS. (3)

The meaning and function of evaluation in education; the development of a plan for evaluating a homemaking program with emphasis upon types of evaluation devices, their construction and use.

¹³ For further information see College of Education catalog.

EDSE 140. CURRICULUM, INSTRUCTION, AND OBSERVATION. (3)

The place and function of home economics education in the secondary school curriculum. Philosophy of education for home and family living; characteristics of adolescence, construction of source units, lesson plans, and evaluation devices; directed observations in junior and senior high school home economics departments.

EDSE 148E. TEACHING VOCATIONAL HOME ECONOMICS IN THE SECONDARY SCHOOLS. (2-8)

First and second semesters.

For Graduates

EDSE 260. SEMINAR IN HOME ECONOMICS EDUCATION. (2)

EDSE 261. TRENDS IN THE TEACHING AND SUPERVISION HOME ECONOMICS. (2-4)

Study of home economics programs and practices in light of current educational trends. Interpretation and analysis of democratic teaching procedures, outcomes of instruction, and supervisory practices.

HOUSING, APPLIED DESIGN AND CRAFTS

Professor and Chairman: SHEARER.

Assistant Professors: BECKWITH, ROPER.

Instructors: HOLVEY, RITZMAN, ROPKO, SCHMITZ.

Lecturer: DAVIS, STRINER.

HOUSING, APPLIED DESIGN AND CRAFTS

APDS 001. FUNDAMENTALS OF DESIGN. (3)

First and second semesters. Knowledge of basic art elements and principles gained through design problems which employ a variety of media. (Meets requirement for Home Economics core.)

APDS 002. DESIGN II. (3)

First and second semesters. Prerequisite: APDS 001. Continued exploration of design as a means of visual expression. Extension of APDS 001 with added emphasis on color and lighting.

APDS 003. DESIGN III: THREE-DIMENSIONAL DESIGN. (3)

First and second semesters. Three laboratory periods. Prerequisites: APDS 001, 002. Creative efforts directed to discriminating use of form, volume, depth, and movement.

APDS 004. SURVEY OF ART HISTORY. (3)

First and second semesters. A rapid survey of Western culture expressed through and influenced by the visual arts: monumental and residential architecture; furniture, textiles and costume; painting and sculpture. (Meets requirements for Home Economics core).

APDS 010. PRESENTATION TECHNIQUES. (3)

First and second semesters. Three laboratory periods. Prerequisites: APDS 001, 002 or equivalent. Comparative approach to basic presentation techniques used in the several areas of commercial design.

APDS 011. ACTION DRAWING-FASHION SKETCHING. (3)

Second semester. Three laboratory periods. Prerequisites: APDS 001 and consent of instructor. Study of the balance and proportion of the human figure. Sketch techniques applied to action poses and fashion drawing in soft and lithograph pencils, pastels, water color, ink. Drawing from model.

APDS 020. INTRODUCTION TO FASHION DESIGN. (3)

First and second semesters. Three laboratory periods. Prerequisite: APDS 001 or equivalent. Basic fashion figure drawing. Original designs rendered in transparent and opaque water color, soft pencil, pastels, and ink. Primarily for non-majors.

APDS 030. SILK SCREEN PRINTING. (3)

First or second semester. Three laboratory periods. Prerequisites: APDS 001, 002, or equivalent. Use of silk screen processes in execution of original designs for commercial production.

APDS 038. PHOTOGRAPHY. (2)

First and second semesters. One lecture, 3 hours laboratory. Prerequisites: APDS 001, 002, or equivalent. Study of fundamental camera techniques. Exploration of the expressive possibilities in relation to the field of design and visual communication.

*For Advanced Undergraduates and Graduates***APDS 120. FASHION ILLUSTRATION. (3)**

First semester. Three laboratory periods. Prerequisites: APDS 001, 002, 003, 010, 011. Fabric and clothing structure as they relate to illustration. Opportunity to explore rendering styles and techniques appropriate to reproduction methods currently used in advertising. Guidance in development of individuality in presentations.

APDS 121. FASHION DESIGN AND ILLUSTRATION. (3)

Second semester. Three laboratory periods. Prerequisite: APDS 120. Design and illustration of fashions appropriate to the custom market and to mass production.

APDS 122-123. ADVANCED COSTUME. (2, 2)

First and/or second semesters. Prerequisites: APDS 120 or 121. Advanced problems in fashion illustration or design. Problems chosen with consent of instructor.

APDS 130. TYPOGRAPHY AND LETTERING. (3)

First and second semesters. Three laboratory periods. Prerequisites: APDS 001, 002. Experience in hand lettering techniques as a means of understanding lettering styles in design composition. Recognition of type faces used in advertisement, book, and magazine layout. Effect of printing processes on design choices.

APDS 132. ADVERTISING LAYOUT. (3)

First semester. Three laboratory periods. Prerequisites: APDS 130, INED 001. Design of advertising layouts from initial idea to finished layout. Typography and illustration as they relate to reproduction processes used in direct advertising.

APDS 134-135. ADVANCED PROBLEMS IN ADVERTISING DESIGN. (3, 3)

Second semester. Two laboratory periods. Prerequisite: APDS 132. Advanced problems in design and layout planned for developing competency in one or more areas of advertising design.

APDS 136. DISPLAY DESIGN. (3)

First and second semesters. Three laboratory periods. Prerequisites: INED 001, APDS 130 or equivalent. Application of design principles to creative display appropriate to exhibits, design shows, merchandising. Display construction.

APDS 138. ADVANCED PHOTOGRAPHY. (2)

First and second semesters. Two laboratory periods. Prerequisite: APDS 038. Composition, techniques, and lighting applicable to illustration, documentation, advertising design and display.

APDS 139. ADVANCED PHOTOGRAPHY. (3)

First and second semesters. Three laboratory periods. Continuation of APDS 138.

APDS 180. PROFESSIONAL SEMINAR. (2)

Second semester. Two lecture-discussion periods. Prerequisite: departmental major with junior standing. Professional and career opportunities, ethics, practices.

APDS 190. INDIVIDUAL PROBLEMS IN APPLIED DESIGN. (3-4)

(190-a—Advertising; 190-b—Costume)

Open only to advanced students who, with guidance, can work independently.

HOUSING, APPLIED DESIGN, AND CRAFTS**(CRAF Series)****CRAF 001. CRAFT FUNDAMENTALS AND MATERIALS. (3)**

First semester. Three laboratory periods. Prerequisites: APDS 001 or equivalent. Introduction to materials and techniques. Recognition of design limitations imposed by inherent quality of materials.

CRAF 002. RECREATIONAL CRAFTS. (2)

First and second semesters. Two laboratory periods. Prerequisites: APDS 001 or equivalent. Problems to encourage creative expression in variety of materials. Emphasis on achievement of aesthetic quality in use of easily available materials, simple tools. Suitable for non-majors.

CRAF 020. CERAMICS I—MATERIALS AND PROCESSES. (3)

First and second semesters. Three laboratory periods. Prerequisites: APDS 001 and consent of the instructor. Fundamental preparation and use of clay. Execution of original designs while developing elementary skills in the production of clay sculpture and pottery.

CRAF 030. METALRY I. (3)

First and second semesters. Three laboratory periods. Prerequisites: APDS 001 plus one additional design course, or equivalent. Opportunity to develop basic skills in the execution of creatively conceived design problems in copper and silver. Standards of craftsmanship as they relate to design quality.

CRAF 040. WEAVING. (3)

First semester. Three laboratory periods. Prerequisites: APDS 001, 002, or equivalent, TXCL 005. Basic weaves, patterns drafts. Creative weaving as a study of texture, pattern, and color appropriate to purpose.

CRAF 041. DECORATIVE TEXTILES. (3)

Second semester. Three laboratory periods. Prerequisites: APDS 001, 002 or equivalent. Execution of original designs appropriate to textile decoration, fibers and fabrics used and to the process involved (i.e. batik, block printing, silk screen, stitchery and applique')

*For Advanced Undergraduates and Graduates***CRAF 102. CREATIVE CRAFTS. (3)**

First and second semesters. Three laboratory periods. Prerequisite: CRAF 001 or 002. Problems to stimulate creative experimentation as approach to design. Work with paper, fabric, clay, wood, metal.

CRAF 120-121. ADVANCED CERAMICS I, ADVANCED CERAMICS II. (3, 3)

First and second semesters. Three laboratory periods. Prerequisite: CRAF 020. Experience in experimental development of body and textures, glazes, and colors and their utilization in clay products of original design. Calculation of body and glaze composition.

CRAF 130-131. ADVANCED METALRY I, ADVANCED METALRY II. (2, 2)

First or second semester. Two laboratory periods. Prerequisite: CRAF 030. Advanced application of skills to design and fabrication of metals; jewelry, stone setting, metal casting, cloisonne' hand-raised hollow ware.

CRAF 140-141. ADVANCED WEAVING, AND/OR ADVANCED TEXTILE DESIGN. (2, 2)

First or second semester. Two laboratory periods. Prerequisites: CRAF 040, 041. Execution of original textile designs which reflect the demands both of the custom market and of mass production. Problems chosen with the consent of instructor.

CRAF 190. INDIVIDUAL PROBLEMS IN CRAFTS. (3-4)

(190-a—Ceramics; 190-b—Metalry; 190-c—Textiles)

Open only to advanced students who, with guidance, can work independently.

(HSAD Series)**HSAD 040. DESIGN AND FURNISHINGS IN THE HOME. (3)**

First and second semesters. 3 lectures a week. Prerequisites: APDS 001 or 004. Designed to meet need for basic information and competency in choice and arrangement of home furnishings. For NON-MAJORS only.

HSAD 041. FAMILY HOUSING. (3)

First semester. Housing and its relationship to family living. A study of factors which shape housing design; investigation of group and individual housing needs and values.

HSAD 046. MATERIALS OF INTERIOR DESIGN. (3)

Second semester. Prerequisite: Consent of instructor. Investigation of materials and construction characteristics of interior architecture and furnishings. Emphasis on use, limitations, sources. Directions in current research.

*For Advanced Undergraduates and Graduates***HSAD 140. PERIOD HOMES AND THEIR FURNISHINGS. (3)**

First semester. Prerequisites: APDS 001, HSAD 046, or equivalent. A study of authentic interiors and furnishings. Exploration of style influences apparent in contemporarily produced items.

HSAD 141. CONTEMPORARY DEVELOPMENTS IN ARCHITECTURE, INTERIORS, FURNISHINGS. (3)

Second semester. Prerequisite: HSAD 046 and consent of instructor. Style origins and development of twentieth century architecture as living space. Architects, designers, trends, philosophy of relationship of interior space to furnishings.

HSAD 142. SPACE DEVELOPMENT. (3)

First semester. One lecture, 2 two-hour laboratories. Prerequisites: APDS 001, 002, 003, INED 001, or equivalent. A study of blue prints and house construction as they relate to the interior designer. Development and drafting of original plans emphasizing the functional spatial relationship of furnishings to interiors.

HSAD 143. INTERIOR DESIGN I. (3)

First semester. One lecture-discussion, two laboratory periods. Prerequisites: APDS 010, INED 001 or equivalent. Complete presentation of rooms: isometric and perspective projections rendered in color; purchase and work orders. Emphasis on individual and family living space.

HSAD 144. INTERIOR DESIGN II. (3)

First and second semesters. One lecture-discussion, two laboratory periods. Prerequisite: HSAD 143. Continuation of HSAD 143 with emphasis on commercial and contract assignments.

HSAD 145. PROFESSIONAL ASPECTS OF INTERIOR DESIGN. (3)

First and second semesters. One lecture plus work experience. Professional orientation, ethics, and practices.

HSAD 146-147. INTERIOR DESIGN III, IV. (4, 4)

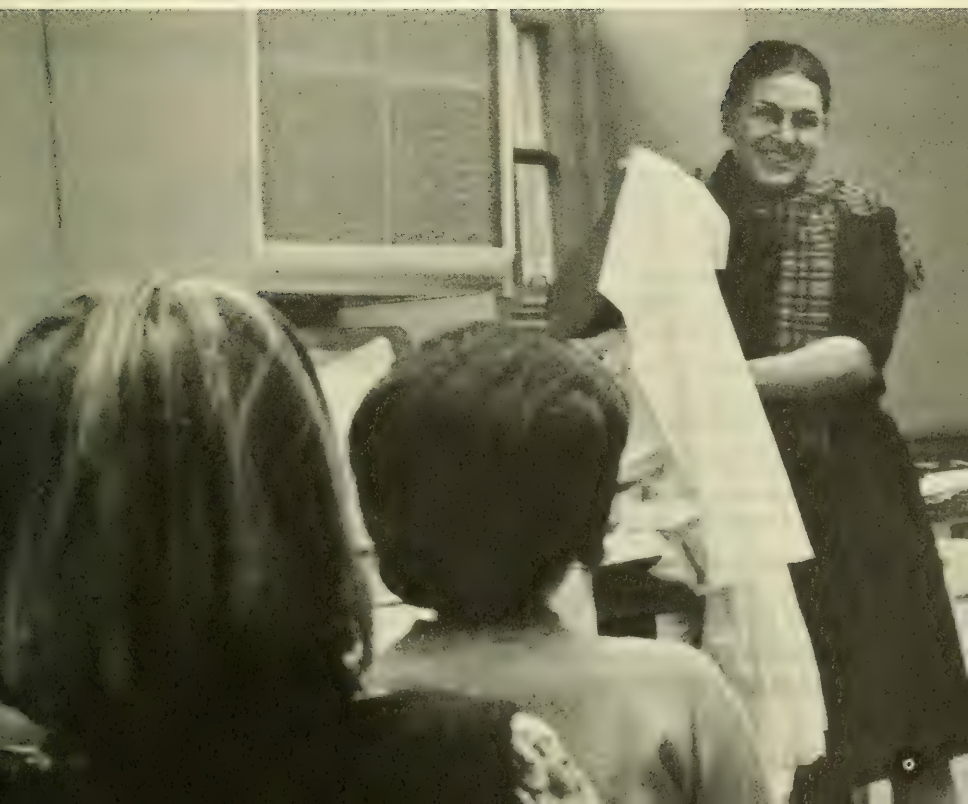
First and/or second semesters. 8 hours laboratory. Prerequisite: HSAD 144. Preparation of complete presentation: work specifications, floor plans, purchase orders, renderings, etc. Portfolio preparation.

HSAD 148. READINGS IN HOUSING. (3)

Second semester. Seminar. Prerequisites: SOCY 001, HSAD 041, Senior standing. To satisfy individual interests and needs, opportunity afforded for concentrated reading on one or more facets of housing (urban renewal, public housing, etc.) Examination of completed research, needed future research.

HSAD 190. INDIVIDUAL STUDY IN HOUSING AND/OR INTERIOR DESIGN. (3-4)

Guidance for the advanced student capable of independent subject matter investigation or creative work. Problem chosen with consent of instructor.



The Faculty

Administrative Officers

BROOKS, Marjory, Professor of Home Economics and Dean of the College of Home Economics

B.S., Mississippi State College for Women, 1943; M.S., University of Idaho, 1951; Ph.D., Ohio State University, 1963.

Professors

CURTISS, Vienna, Professor of Applied Design

Certificate, Parsons School of Design, 1930; B.A., Arizona State University, 1933; M.A., Columbia University, 1935; Ed.D., 1957.

PRATHER, Elizabeth S., Professor and Head, Department of Food, Nutrition and Institution Administration

B.S., Auburn University, 1951; M.S., 1955; Ph.D., Iowa State University, 1963.

SHEARER, Jane K., Professor and Head of Department of Housing and Applied Design

B.S., University of Tennessee, 1940; M.S., 1950; Ph.D., Florida State University, 1960.

Associate Professors

AHRENS, Richard A., Associate Professor of Food and Nutrition

B.S., University of Wisconsin, 1958; Ph.D., University of California, 1963.

BROWN, William D., Associate Professor and Head of Department of Family and Community Development

A.B., Lynchburg College, 1959; B.D., Texas Christian University, 1962; M.Th., 1962; Ph.D., Florida State University, 1965.

BUTLER, Lillian C., Associate Professor of Food and Nutrition

B.S., University of Illinois, 1941; M.A., University of Texas, 1945; Ph.D., University of California, 1953.

LEMMON, Louise, Associate Professor of Home Economics Education

B.S., Northern Illinois University, 1946; M.S., University of Wisconsin, 1951; Ed.D., University of Illinois, 1961.

OLSON, David H., Assistant Professor of Family and Community Development

B.A., St. Olaf College, 1962; M.A., Wichita State University, 1964; Ph.D., Pennsylvania State University, 1967.

WILSON, Leda A., Associate Professor of Home Economics

B.S., Lander College, 1943; M.S., University of Tennessee, 1950; Ed.D., 1954.

Assistant Professors

- BANGS**, Sybil, Assistant Professor of Institution Administration
B.S., Kansas State University, 1943; M.S., 1960.
- BECKWITH**, Cornelia L., Assistant Professor of Applied Design
Ph.B., University of Chicago, 1929; M.A., Columbia University, 1937.
- BRIGGS**, Margaret, Assistant Professor of Home Economic Education
B.S., Nebraska State Teachers College, 1954; M.S., Iowa State University, 1960.
- CHURAMAN**, Charlotte V., Lecturer, Family and Community Development
B.Sc., Berea College, 1942; M.Ed., Pennsylvania State University, 1964.
- EHEART**, Mary S., Assistant Professor of Food and Nutrition
A.B., Park College, 1933; A.M., University of Chicago, 1935.
- HEAGNEY**, Eileen M., Assistant Professor of Textiles and Clothing
B.S., Pennsylvania State University, 1941; M.A., Columbia University, 1949.
- ORVEDAL**, Ruth W., Assistant Professor of Home Management
B.S., Middle Tennessee State College, 1937; M.S., University of Tennessee, 1941.
- ROPER**, James B., Assistant Professor of Applied Design
B.S., East Carolina College, 1961; M.A., 1963.
- WILBUR**, June C., Assistant Professor of Textiles and Clothing
B.S., University of Washington, 1936; M.S., Syracuse University, 1940.
- ZALLEN**, Eugenia M., Assistant Professor of Food and Nutrition
B.S., Auburn University, 1953; M.S., Purdue University, 1960.

Instructors

- GARRISON**, Martha, Instructor in Family Life and Management
B.S., Michigan State University, 1938; M.S., University of Maryland, 1963.
- HARWOOD**, Velma, Instructor in Food and Nutrition
B.S., University of Illinois, 1935; M.S., University of Maryland, 1965.
- HOLVEY**, Samuel B., Instructor in Applied Design
B.A., Syracuse University, 1967.
- KNIGHTON**, Ruth, Instructor in Food and Nutrition
B.S., University of Massachusetts, 1961; M.S., University of Maryland, 1965.
- MacMAHON**, B. ELLEN, Instructor in Family Life and Management
B.S., Madison College, 1963; M.A., Michigan State University, 1967.
- NIFFENEGGER**, Elnor J., Instructor in Food and Nutrition
B.S., Iowa State University, 1953; M.S., Montana State University, 1964.
- NELSON**, William E., Instructor in Housing and Applied Design
A.A., University of Bridgeport, 1964; B.S., 1965; M.S., Florida State University, 1968.

ODLAND, Sheldon, Instructor in Housing and Applied Design

B.A., Pennsylvania State University, 1958.

PLEDGER, Virginia Lee, Instructor in Textiles and Clothing

A.A., Graceland College, 1955; B.S., Iowa State University, 1957; M.H.E., University of Georgia, 1966.

RITZMANN, Barbara J., Instructor in Housing and Applied Design

B.A., Pennsylvania State University, 1945; M.F.A., George Washington University, 1966.

ROPKO, Elaine, Instructor in Housing and Applied Design

B.A., Holy Family College, 1958; M.F.A., Catholic University, 1961.

SCHMITZ, Robert D., Instructor in Housing and Applied Design

B.S., East Carolina College, 1962; M.S., Alfred University, 1965; M.F.A., University of Wisconsin, 1967.

SOUTHER, Mary Lou, Instructor in Textiles and Clothing

B.S., Oneonta State University College, 1962; M.S., Cornell University, 1963.

VAN EGMOND, Dorothy, Instructor in Food and Nutrition

B.S., 1958, Mississippi College; M.A., University of Mississippi, 1961.

Lecturers

DAVIS, Fremont, Lecturer in Applied Design

STRINER, Erma, Lecturer in Housing and Applied Design

B.A., Douglass College, 1943.

Research Assistants

DAWSON, Virginia T.

B.A., Ohio State University, 1937; M.S., University of Maryland, 1939.

COLLEGE OF PHYSICAL EDUCATION, RECREATION AND HEALTH

1968-1970

THE
UNIVERSITY OF MARYLAND



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University Calendar 1968-1969

SUMMER SCHOOL, 1968

JUNE	24-25	Monday-Tuesday	Summer School Registration
	26	Wednesday	Instruction begins
JULY	4	Thursday	Independence Day, holiday
	6	Saturday	Classes (Thursday schedule)
AUGUST	16	Friday	Summer School ends

SHORT COURSES, 1968

JUNE	17-21	Monday-Friday	College Week for Women
AUGUST	5-9	Monday-Friday	4-H Club Week
SEPTEMBER	3-6	Tuesday-Friday	Firemen's Short Course

FALL SEMESTER, 1968

SEPTEMBER	9-13	Monday-Friday	Fall Registration
	16	Monday	Instruction begins
NOVEMBER	27	Wednesday	After last class—Thanksgiving recess begins
DECEMBER	2	Monday	8:00 a.m.—Thanksgiving recess ends
	20	Friday	After last class—Christmas recess begins

1969

JANUARY	6	Monday	8:00 a.m.—Christmas recess ends
	15	Wednesday	After last class—end of instruction
	17-24	Friday-Friday	Fall Semester Examinations

SPRING SEMESTER, 1969

FEBRUARY	3-7	Monday-Friday	Spring Registration
	10	Monday	Instruction begins
	22	Saturday	Washington's Birthday, holiday— No classes
APRIL	3	Thursday	After last class—Spring recess begins
	8	Tuesday	8:00 a.m.—Spring recess ends
MAY	27	Tuesday	After last class—end of instruction
	29-June 6	Thursday-Friday	Spring Semester Examinations
	30	Friday	Memorial Day, holiday— No examinations
JUNE	7	Saturday	Commencement

SUMMER SCHOOL, 1969

JUNE	23-24	Monday-Tuesday	Summer Registration
	25	Wednesday	Instruction begins
JULY	4	Friday	Independence Day, holiday— No classes
AUGUST	15	Friday	Summer Session ends

SHORT COURSES, 1969

JUNE	16-20	Monday-Friday	College Week for Women
	23-25	Monday-Wednesday	State Vocational Agriculture Teachers Conference
AUGUST	5-8	Tuesday-Friday	Maryland 4-H Conference
SEPTEMBER	2-5	Tuesday-Friday	Fireman's Short Course

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GENERAL COMMITTEE ON STUDENT LIFE, WELFARE, RIGHTS AND RESPONSIBILITIES

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 FINANCIAL AIDS AND SELF-HELP
 STUDENT PUBLICATIONS AND COMMUNICATIONS
 RELIGIOUS LIFE
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ADMISSIONS AND SCHOLASTIC STANDING

INSTRUCTIONAL PROCEDURES

SCHEDULING AND REGISTRATION

PROGRAMS, CURRICULA AND COURSES

FACULTY RESEARCH

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FACULTY LIFE AND WELFARE

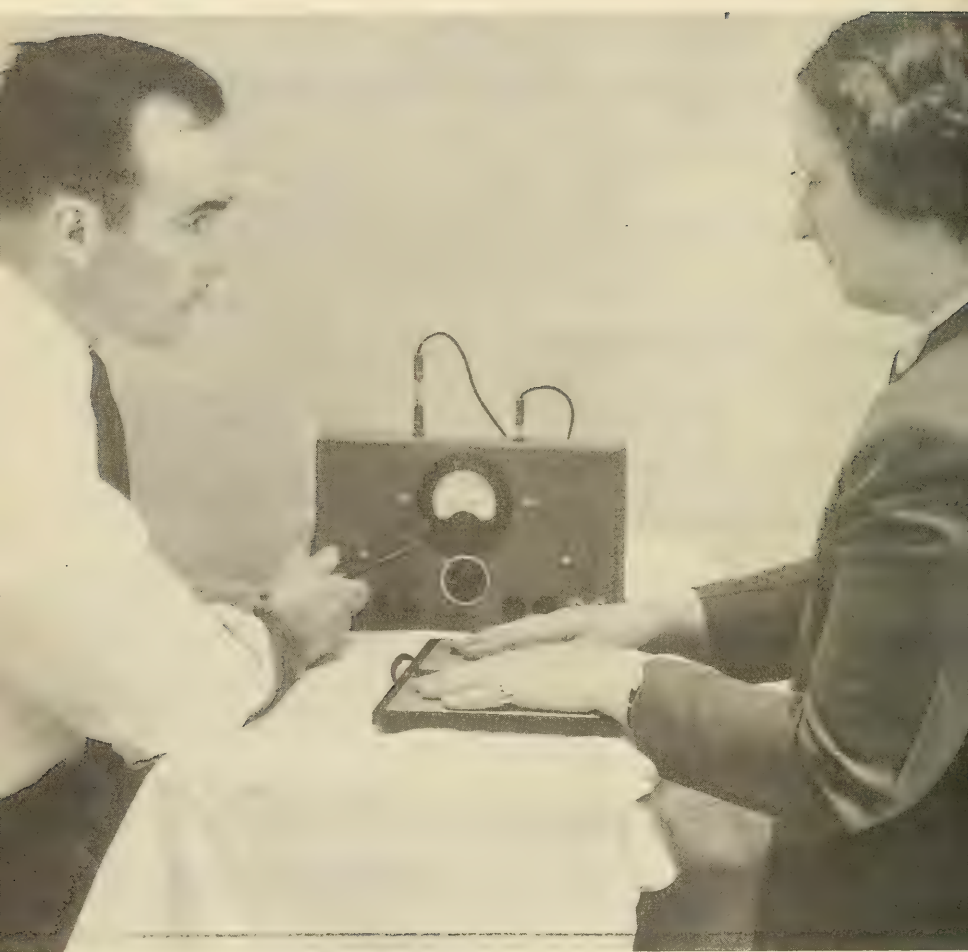
MEMBERSHIP AND REPRESENTATION

COUNSELING OF STUDENTS

BALTIMORE CITY CAMPUS AFFAIRS

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THE FUTURE OF THE UNIVERSITY



The College

THE COLLEGE OF PHYSICAL EDUCATION, RECREATION AND HEALTH PROVIDES preparation leading to the Bachelor of Science degree in the following professional areas: physical education, health education and recreation. The College also offers special curricula in safety education and elementary physical education. Moreover, in conjunction with the Graduate School and the College of Education, graduate programs leading to the master's and doctor's degrees are available in physical education, health education and recreation. The college provides a research laboratory for faculty members and graduate students who are interested in investigating the effects of exercise and various physical education activities upon the body, as well as determining methods and techniques of teaching various sports.

A one year required program of physical education and a one semester required health education program are provided by this College for all freshmen men and women of the University. The College provides an extensive intramural sports program for both men and women.

In addition to its various on-campus offerings, this College regularly conducts courses in physical education, health education and recreation in various parts of the State of Maryland and conducts workshops wherever requested by proper officials.

Facilities

Five separate buildings are used for the Intramural Sports Program for men, the WRA Program for women, the Professional Physical Education Program, the Health Education Program and the Recreation Program. There is also ample outdoor space. Some of the facilities are shared with the Intercollegiate Athletic Program.

Indoor Activities

THE STUDENT ACTIVITIES BUILDING. This building houses the offices of the Department of Intercollegiate Athletics and the College of Physical Education, Recreation, and Health. It contains six activity teaching stations: the main arena, the swimming pool, the small gym, the weight training room, the wrestling room, and combination indoor golf driving range and dance studio. In addition, there are six classrooms, a research laboratory, a departmental library, and conference room.

The main arena of this building has a seating capacity of 12,004 and 19,796 sq. ft. of floor space. This arena provides facilities for class work in basketball, volleyball, badminton, and bait casting.

The swimming pool is divided into two areas by a permanent bulkhead. The shallow end is 42 x 24 feet and the large area is 42 x 75 feet with a depth ranging from 4 to 13 feet.

The small gymnasium is used for gymnastics, including tumbling, trampolining and all types of apparatus work. The total floor space is 9,462 sq. ft.

There is a wrestling room containing (8,056 sq. ft.)

The weight training class room is equipped with sufficient weights for 11 stations of three men each.

The studio-golf driving range (3,256 sq. ft.) has two nylon nets which provide four golf driving stations. In addition, part of the floor is covered with a green rug for putting practice. The nets may be raised so that the entire floor space is available for dancing.

PREINKERT FIELD HOUSE. Preinkert Field House contains the offices of both men and women teachers of Physical Education and Health Education. There is a regulation size swimming pool, 75 x 35 feet equipped with two one-meter diving boards. In the gymnasium, 90 x 50 feet, classes are held in badminton, volleyball, basketball, stunts and tumbling, apparatus and tennis. There are two large backboards used for indoor tennis practice. The adjacent classroom is used for professional classes and contains audio-visual equipment. The dance studio, used for dance classes, is 40 x 60 feet.

In addition to the above areas, there are locker and shower rooms used by those enrolled in physical education and those participating in recreational activities and a small lounge for major students.

ARMORY. The Armory is used primarily for the intramural program. It houses the offices of the Director of Intramurals and an athletic equipment room from which students may secure equipment for recreational purposes. The 28,800 sq. ft. of floor space has four full length basketball courts, with badminton and volleyball courts superimposed on them. This facility is also used as an indoor track, with an indoor vaulting, high and broad jump pits, a one-tenth mile track, and a 70 yard straight-away.

COLISEUM. The Coliseum is used as a supplementary facility for the intramural and required program of physical education for men and women. Included in the facilities are an equipment issue room, adequate shower and locker rooms for both men and women, a classroom, and office space for several of the men's and women's physical education staff.

The 6,555 square feet of floor space is used primarily for required co-educational classes in square and social dance and for intramural basketball. In addition to the one large basketball court, however, there are five badminton and two volleyball courts available for co-ed class instruction.

THE HEALTH EDUCATION CLASSROOM BUILDING (AA)

This building is utilized primarily by the required and health major programs. There are, however, two large rooms which are used by the required physical education program. Four classrooms are included for the health programs. In addition, this building contains the offices for the staff of the Department of Health Education.

Outdoor Activities

THE STADIUM. The stadium, with a seating capacity of 33,536 has a one-quarter mile cinder track with a 220-yard straightaway. Pits are available for pole vaulting and high and broad jumping. Immediately east of the stadium are facilities

for the shot put, discus and javelin throw. The College of Physical Education, Recreation, and Health use these facilities for required classes in track and field. Also east of the stadium are 13.1 acres devoted to three practice football fields, the baseball stadium, a practice baseball, lacrosse, and soccer field. The College uses these facilities for major skill classes in football, soccer, and baseball. West of the stadium are 11.3 acres devoted entirely to physical education out-door play fields. There are four combination soccer-touch football play fields, with complete goal posts, and four softball fields with wire backstops.

Surrounding the Armory are four touch football fields and eight softball fields, encompassing 18.4 acres. These fields, plus the four in the Fraternity Row horseshoe are used exclusively for intramurals.

Immediately west of the Cole Activities Building are eight all-weather tennis courts. A modern 18-hole golf course was opened in 1957. This 204-acre course includes two lakes, and an additional 5.8-acre golf driving range for instructional purposes. The golf driving range, equipped with lights, and the golf course greatly adds to our present recreational facilities. An outdoor playing field 300 feet by 600 feet is also provided for touch football, soccer, speedball and softball.

The outdoor facilities adjacent to the Preinkert Field House include eight hard surfaced tennis courts, an archery range with space for 18 targets, two softball diamonds and combination hockey and soccer fields.

Research Laboratory

One of the important aspects of advanced study at the University of Maryland is research. To encourage research, the College of Physical Education, Recreation, and Health makes available to the student a spacious, well equipped research laboratory. Students and faculty alike are encouraged to make use of the laboratory and its facilities for the purpose of conducting their special research projects.

Cultural and Recreational Opportunities

Near the University of Maryland are found many points of cultural and recreational interest. In Washington, D.C., one may visit national shrines and museums, e.g., the Smithsonian Institute, the Medical Museum, etc., and also attend lectures, musical recitals and stage productions, featuring outstanding personages. The Freer Gallery of Art and the Folger Shakespeare Library are located in Washington. Within from one to four hours traveling time by car one finds such points of historical and recreational interest as Mt. Vernon, Gettysburg, Harpers Ferry, Antietam, Annapolis, Monticello, Williamsburg, Jamestown, Yorktown, the Shenandoah Valley, Skyline Drive, Rehoboth Beach and Ocean City, Maryland. A number of Chesapeake Bay beaches and resorts can be reached from the campus within forty-five minutes. The University also makes available for recreational purposes, swimming pools, tennis courts, and similar facilities. During Summer School a special recreational program is conducted for all students; this includes sightseeing tours, group trips to summer stock stage productions, square dancing, musical events, sports tournaments, and movies.

General Information

Admission

FALL SEMESTER. All applications for full-time undergraduate admission for the Fall Semester at the College Park campus must be received by the University on or before July 15. Any student registering for seven (7) or more semester hours of work is considered a full-time student.

Under unusual circumstances, applications will be accepted between July 15 and September 1. Applicants for full-time attendance filing after July 1 will be required to pay a non-refundable \$25.00 late fee to defray the cost of special handling of applications after that date. This late fee is in addition to the \$10.00 application fee.

All undergraduate applications, both full-time and part-time attendance, and all supporting documents for an application for admission must be received by the appropriate University office by September 1. This means that the applicant's educational records, SAT scores (in the case of new freshmen) and medical examination report must be received by September 1.

SPRING SEMESTER. The deadline for the receipt of applications for the Spring Semester is January 1.

UNIVERSITY COLLEGE. The application deadlines and fees *do not* apply to students registering in the evening classes offered by the University College.

GRADUATE SCHOOL. Application for admission to the Graduate School must be made by September 1 for the fall term and by January 1 for the spring term on blanks obtained from the Office of the Graduate School. Admission to the summer session is governed by the date listed in the Summer School catalog. The summer session deadline date is generally June 1.

Entrance Requirements

All students desiring to enroll in the College of Physical Education, Recreation, and Health must apply to the Director of Admissions of the University of Maryland at College Park.

Sixteen units of high school credits are required for admittance to this college. *Required* high school subjects are: four units of English, one unit of social science, and one unit of natural science. *Desirable* high school subjects include: algebra, plane geometry and additional natural and physical sciences, such as chemistry and physics.

Satisfactory health and physical vigor are essential for persons pursuing a career in the areas of this College.

Expenses

Annual expenses of attending the University are approximately as follows: \$300.00 fixed charges, \$104.00 special fees, \$480.00 board, \$340.00 lodging for Maryland residents, or \$440.00 for residents of other states and countries. A matriculation fee of \$10.00 is charged all new students and is payable only once. A fee of \$10.00 must accompany a prospective student's application for

admission. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. A charge of \$450 is assessed to all students who are non-residents of the State of Maryland.

An Adventure in Learning, the undergraduate catalog of the University, contains a detailed statement of fees and expenses and includes changes in fees as they occur. A copy may be requested from the Catalog Mailing Office, North Administration Building, University of Maryland, College Park, Maryland 20742.

Definition of Residence and Non-Residence

Students who are minors are considered to be resident students if at the time of their registration their parents have been domiciled in the State of Maryland for at least six months.

The status of the residence of a student is determined at the time of his first registration in the University and may not hereafter be changed by him unless, in the case of a minor, his parents move to and become legal residents of Maryland by maintaining such residence for at least six months. However, the right of the minor student to change from a non-resident status to resident status must be established by him prior to the registration period set for any semester.

Adult students are considered to be residents if at the time of their registration they have been domiciled in Maryland for at least six months provided such residence has not been acquired while attending any school or college in Maryland or elsewhere. Time spent on active duty in the armed services while stationed in Maryland will not be considered as satisfying the six-months period referred to above except in those cases in which the adult was domiciled in Maryland for at least six months prior to his entrance into the armed service and was not enrolled in any school during that period.

The word "domicile" as used in this regulation shall mean the permanent place of abode. For the purpose of this rule only one domicile may be maintained.

Air Science Instruction

The Department of Air Science offers two all-voluntary programs in Air Force ROTC at the University of Maryland. Successful completion of either the two-year or the four-year program qualifies a student for a commission in the United States Air Force upon graduation.

Selected students who wish to do so may, with proper approval, carry Advanced Air Science courses as electives during their junior and senior years. Financial assistance is provided for students in the Advanced program. Specific information on either the two-year or the four-year program is included in the *University General and Academic Regulations*.

For Additional Information

Detailed information concerning the General Education Program, fees and expenses, scholarships and awards, student life, and other material of a

general nature, may be found in the University publication titled *An Adventure in Learning*. This publication may be obtained on request from the Office of University Relations, North Administration Building, University of Maryland at College Park. A detailed explanation of the regulations of student and academic life, may be found in the University publication titled, *University General and Academic Regulations*. This is mailed in September and February of each year to all new undergraduate students.

Requests for course catalogs for the individual schools and colleges should be directed to the deans of these respective units, addressed to:

COLLEGES LOCATED AT COLLEGE PARK:

Dean
(College in which you are interested)
The University of Maryland
College Park, Maryland 20742

PROFESSIONAL SCHOOLS LOCATED AT BALTIMORE:

Dean
(School in which you are interested)
The University of Maryland
Lombard and Greene Streets
Baltimore, Maryland 21201

Undergraduate Professional Curricula

Guidance

At the time of matriculation and first registration, each student is assigned to a member of the faculty of the College who acts as the student's academic adviser. This faculty member will be in physical education, recreation or health education, depending on the student's choice of curriculum. The student should confer regularly with his adviser prior to and at the time of each registration.

Normal Load

The normal university load for students is 15-19 credit hours per semester. The requirements in physical education and health for men and women are fulfilled by professional courses in the College. No student may register for more than 19 hours unless he has a "B" average for the preceding semester and approval of the Dean of the College.

Electives

Electives should be planned carefully, and well in advance, preferably during the orientation course the first semester, or with the student's academic adviser

during the second semester. It is important to begin certain sequences as soon as possible to prevent later conflict. Electives may be selected from any department of the University in accordance with a student's professional needs. Those selected must meet with the approval of the adviser and the Dean of the College.

Transfer Students

Only students in good standing as to scholarship and conduct are eligible to transfer into this College from another college or university. Only courses applicable to his curriculum and passed with a grade of "C" or better will be transferred. Students wishing to transfer to this College from another college of this University are subject to the general University regulations on his subject, explained in the publication, *University General and Academic Regulations*.

Freshman and Sophomore Programs

The work of the first two years in this College is designed to accomplish the following purposes: (1) provide a general basic or core education and prepare for later specialization by giving a foundation in certain basic sciences; (2) develop competency in those basic techniques necessary for successful participation in the professional courses of the last two years.

While much of the academic course work will be alike, the technique courses will vary considerably in the different curriculums. The core of University requirements should be completed in the first two years in such manner as to justify acceptance as a junior in the desired major. The technique courses must be satisfactorily completed, or competencies demonstrated before the student can be accepted for the advanced courses in methods and in student teaching. It is very important that each requirement be met as it occurs.

Student Teaching

Opportunity is provided for student teaching experience in Physical Education and/or Health Education. The student devotes eight weeks during his last semester of his senior year to observation, participation, and teaching under a qualified supervising teacher in an approved elementary, junior or senior high school or in a combined program at the elementary and secondary levels in the vicinity of the University. The student progresses to gradual assumption of all of the responsibilities of the supervising teacher. A University supervisor from the College of Physical Education, Recreation, and Health visits the student periodically and confers with both the student teacher and the cooperating teacher, giving assistance when needed.

To be eligible for student teaching, the student must (1) have an accumulative grade point average of at least a 2.3, (2) *must have the recommendation of the University supervising teacher, and* (3) *must have fulfilled all required courses for the B. S. degree except those in the Block Student Teaching Semester except for those exceptions approved by each department.* The student must obtain a grade of "C" or better in all professional courses in his curriculum and



he must register for all courses in the "Block" concurrently. Those desiring to teach at the elementary level must have successfully completed PHED 120 and must split their teaching experience into 4 hours of EDSE 147 and 4 hours of EDSE 149. Those desiring an elementary minor in physical education in addition, must complete PHED 55, 57, and 195.

Field Work

Recreation major students are expected to carry out a number of field experiences during their University career; volunteer or part-time recreation employment during the school year, summer employment in camps or at playgrounds, etc. These experiences culminate in a senior semester of field work for which a student receives credit and during which the student works as a staff member (for 20 hours per week) in the field of recreation in which he or she hopes to be employed such as public recreation, recreation for the exceptional, agencies (Y's, Scouts, etc.), military recreation, etc.

Degrees

The degree of Bachelor of Science is conferred upon students who have met the conditions of their curricula as herein prescribed by the College of Physical Education, Recreation, and Health.

Each candidate for a degree must file a formal application with the Office of the Registrar eight weeks prior to the date of graduation.

Certification

The Maryland State Department of Education certifies for teaching only when an applicant has a tentative appointment to teach in a Maryland county school. No certificate may be secured by application of the student on graduation. Course content requirements for certification are indicated with each curriculum. Certification is specifically limited to graduates who "rank academically in the upper four-fifths of the class and who make a grade of 'C' or better in student teaching." In order to insure the meeting of these requirements, students will not be approved for students teaching except as indicated above. A student intending to qualify as a teacher in Baltimore, Washington, or other specific situations should secure a statement of certification requirements before starting work in the junior year and discuss them with his academic adviser.

Professional Curricula

PHYSICAL EDUCATION

This curriculum prepares students (1) for teaching physical education in the secondary school, (2) for coaching, and (3) for leadership in youth and adult groups which offer a program of physical activity. The first two years of this curriculum are considered to be an orientation period in which the student has an opportunity to gain an adequate background in general education as well as in those scientific areas closely related to this field of specialization. In addition, emphasis is placed upon the development of skills in a wide range of motor activities. Further, students are encouraged to select related areas, especially in the fields of biology, social science, psychology, health education, and recreation as fields of secondary interest. These materially increase the vocational opportunities which are available to a graduate in physical education.

EQUIPMENT: Students may be required to provide individual equipment for certain courses.

UNIFORMS: Suitable uniforms, as prescribed by the College are required for the activity classes and for student teaching. These uniforms should be worn only during professional activities.

Men—During the freshman and sophomore years, men will wear red and black T-shirts, black trunks, white socks, gym shoes, supporter and sweat suit. During the junior year, men will purchase full length black pants with gold braid on side and a black jacket, which are required for student teaching.

Women—Tailored blue shorts, white shirt, ankle socks, and tennis shoes, and leotard and skirt, and warm-up suit.

For Student Teaching—an appropriate teaching costume will be selected under the guidance of the supervisor of student teaching before the beginning of the junior year.

PHYSICAL EDUCATION CURRICULUM FOR MEN

	Semester	
	I	II
FRESHMAN YEAR¹		
ENGL 1—Composition	3	..
Social Science Elective ² .....	..	3
MATH (any above Math. 1) ¹	3	..
ZOOL 1—General Zoology .....	..	4
SPCH 7—Public Speaking	2	..
HLTH 40—Personal and Community Health .....	..	3
PHED 30—Introduction to Physical Education and Health ..	2	..
PHED 50—Rhythmic Activities	2	..
PHED 61, 63—Skills Laboratory	2	2
PHED 77—Aquatics .....	..	2
Electives	3	3
Total	17	17
SOPHOMORE YEAR		
ENGL 3, 4—Composition and World Literature	3	3
ZOOL 14, 15—Human Anatomy and Physiology	4	4
Social Science Elective	3	..
PHED 65, 67—Laboratory Skills	2	2
HIST 21 or 22—U. S. History .....	..	3
Science Group Requirement (Physics or Chemistry 1) .....	..	4
HLTH 50—First Aid and Safety	1	..
Electives	4	1
Total	17	17
JUNIOR YEAR		
HIST (Non-U. S.)	3	..
Fine Arts elective .....	..	3
PHED 100—Kinesiology	4	..
PHED 105, 107—Skills Laboratory	2	2
PHED 114—Methods, Curriculum and Observation for Sec- ondary Schools	4	..
PHED 120—Physical Education for the Elementary School ..	..	3
Theory of Coaching elective (PHED 123, 125, or 126)	2	..
PHED 180—Measurement in Physical Education and Health ..	..	3
EDUC 110—Human Development and Learning .....	..	6
Electives	2	..
Total	17	17

¹ Students whose SAT score in Mathematics is below that established by the University will be required to successfully complete MATH 1 during the first semester of the Freshman year.

² Students must elect 6 hours in the Social Sciences. Two courses may be chosen from five fields: Anthropology 1; Economics 31 or 37; Government and Politics 1; Psychology 1; or Sociology 1.

SENIOR YEAR	Semester	
	I	II
EDUC 111—Foundations of Education	3	..
PHED 133—Adapted Physical Education	2	..
EDSE 145—Principles and Methods of Secondary Education ..	..	3
EDSE 148 ³ —Student Teaching in Secondary Schools ....	..	8
PHED 160—Theory of Exercise	3	..
PHED 181—Advanced Training and Conditioning	3	..
PHED 190—Organizations and Administration of Physical Education .....	..	3
PHED 193—History and Philosophy of Sport and Physical Education .....	..	3
Electives	6	..
Total	17	17

PHYSICAL EDUCATION CURRICULUM FOR WOMEN

FRESHMAN YEAR ³	I	II
ENGL 1, 3—Composition and Literature	3	3
Social Science Elective ⁴ .....	..	3
ZOOL 1—General Zoology	4	..
SPCH 7—Public Speaking	2	..
MATH 3 or 10 (any above MATH 1) .....	..	3
PHED 30—Introduction to Physical Education and Health ..	2	..
PHED 40w—Fundamentals of Movement	2	..
PHED 50—Rhythmic Activities	2	..
DANC 52—Dance Techniques .....	..	2
PHED 62w, 64w—Skills Laboratory	2	2
HLTH 40—Personal and Community Health .....	..	3
Electives .....	..	1
Total	17	17

³ Students whose SAT score in Mathematics is below that established by the University will be required to successfully complete MATH 1 during the first semester of the Freshman year.

⁴ Students must elect 6 hours in the Social Sciences. Two courses may be chosen from five fields: Anthropology 1; Economics 31 or 37; Government and Politics 1; Psychology 1; or Sociology 1.

⁵ The qualified student may register for four credits in EDSE 148 and four credits in EDEL 149.

SOPHOMORE YEAR⁶

(Semester
I II)

ENGL 4—World Literature	3	..
ZOOL 14, 15—Human Anatomy and Physiology	4	4
Social Science Elective	3	..
HIST 21 or 22—U.S. History .....	..	3
Science Group Requirement (Chemistry 1 or Physics 1) ....	..	4
HLTH 50—First Aid and Safety	1	..
DANC 54—Dance Techniques	2	..
PHED 66w, 68w—Skills Laboratory	2	2
PHED 77w—Aquatics .....	..	2
PHED 82—Organization and Administration of Intermurals	1	..
Electives	1	2
Total	17	17

JUNIOR YEAR

Fine Arts Elective .....	..	3
History (non U.S.) .....	..	3
PHED 100—Kinesiology	4	..
PHED 105w, 107w—Laboratory Skills	2	2
EDUC 110—Human Development and Learning	6	..
PHED 114—Methods in Physical Education in Secondary Schools	4	..
PHED 120—Physical Education for the Elementary Schools	..	3
PHED 124—Theory of Coaching .....	..	2
PHED 180—Measurement in Physical Education and Health .....	..	3
Electives	1	1
Total	17	17

SENIOR YEAR

EDUC 111—Foundations of Education	3	..
EDSE 145—Principles and Methods of Secondary Education .....	..	3
EDSE 148—Student Teaching in Secondary Schools .....	..	8
PHED 133—Adapted Physical Education	2	..
PHED 160—Theory of Exercise	3	..
PHED 190—Organization and Administration of Physical Education .....	..	3
PHED 193—History and Philosophy of Sports and Physical Education .....	..	3
Electives	9	..
Total	17	17

⁶ PHED 72w may be required, depending upon the swimming ability of the student.

REQUIREMENTS FOR DEGREE IN PHYSICAL EDUCATION

Requirements for the Bachelor of Science degree in physical education in the College of Physical Education, Recreation and Health are as follows:

<i>Men</i>	<i>Sem. Cr.</i>
Professional Physical Education courses (PHED 30, 50, 61, 63, 65, 67, 77, 100, 105, 107, 114, 120, (123 or 125 or 126), 133, 160, 180, 181, 190, 193)	48
Foundation Science courses as presented (ZOOL, 1, 14, 15; PHYS 1 or CHEM 1)	16
Education courses as prescribed	20
General Education Requirements (ENG 1, 3, 4; Fine Arts; HIST 21 or 22 plus non American History Course; MATH 3 or 10; Soc. Sc.; Science, as shown above)	27
Specially prescribed requirements (SPCH 7)	2
Health courses as prescribed (HLTH 40, 50)	4
Electives	19
Total	136

<i>Women</i>	
Professional Physical Education courses (PHED 30, 40w, 50, 52, 54, 62, 64, 66, 68, 77w, 82w, 100, 105, 107, 114, 120, 124, 133, 160, 180, 190, 193)	51
Foundation Science courses as prescribed (ZOOL 1, 14, 15; PHYS 1 or CHEM 1)	16
Education courses as prescribed	20
General Education Requirements (ENGL 1, 3, 4; Fine Arts 3 hrs.; MATH 3 or 10; Soc. Sc. 6 hours; Science, shown above)	27
Specially prescribed requirements (SPCH 7)	2
Health courses as prescribed (HLTH 40, 50)	4
Electives	16
Total	136

MINOR IN PHYSICAL EDUCATION

20 semester hours in physical education and 4 semester hours in cognate areas.

REQUIRED COURSES

Men—PHED 30; P.E. 61, 63, 65, 67, (2-6²); PHED 113; P.E. 123, 125, or 126.

Women—PHED 30; P.E. 62, 64, 66, 68, (2-6¹); PHED 114, PHED 124.

ELECTIVE COURSES

Men and Women—PHED 69, 78w, 100, 133, 160, 180, 190; HLTH 110; HLTH 120; RECR 30; RECR 40; RECR 100; RECR 150; RECR 170.

¹ Selection of courses will be made according to student's background.

If planning to teach, the cognate courses for men should be HLTH 40 and HLTH 50; for women, HLTH 50 and HLTH 120.

NOTE: To be certified to teach in Maryland, 30 semester hours are required in physical education in addition to the following or equivalent, ZOOL 1, 14, 15 and Chemistry or Physics.

There are two plans for a minor in elementary school physical education. Plan A is for students in the College of Physical Education, Recreation, and Health, and Plan B is for students outside the College of Physical Education, Recreation, and Health.

I. Plan A. (for students in this College)

10 semester hours in elementary school physical education courses and 10 hours in cognate areas.

Required courses

PHED 55, 57, 120, 195.

Elective courses

10 hours in any of the following cognate areas: human development, elementary education, biological science, health education. (Not more than 6 hours shall be taken in any one cognate area.)

Student teaching

Students will be required to do 4 weeks of their 8 weeks student teaching at the elementary school level in physical education.

II. Plan B. (for students outside this College)

13 semester hours in elementary school physical education courses and 10 hours in cognate areas.

Required courses

PHED 55, 57, 120, 130, 195.

Elective courses

10 hours in any of the following cognate areas: human development, elementary education, biological science, health education. (Not more than 6 hours shall be taken in any one cognate area.)

RELATED FIELDS MINOR

This minor requires a minimum of 18 credit hours to be elected from any three of the four following areas:



RECREATION CURRICULUM

The increased amount of leisure time existent in our society because of the rapid development of modern civilization, and the imperative need for guidance in the wise use of that leisure time, has made society cognizant of the need for trained recreation leaders.

This curriculum, therefore, is designed to meet the needs of students who wish to qualify for the many positions in the field of recreation, and the needs of those students who desire a background in skills which will enable them to render distinct contributions to community life. The College draws upon various other departments and colleges within the University for courses to balance and enrich its offerings for its recreation curriculum.

Those majoring in recreation have opportunity for observation and practical experience in local, county, state and federal public recreation programs, in social and group work agency programs, and in the various programs of the Armed Forces, American Red Cross, local hospitals, etc. Major students are encouraged to select an 'option' area of interest around which to center their elective courses (for instance: public recreation, recreation for the ill and handicapped, outdoor recreation, etc.)

RECREATION CURRICULUM (Men and Women)

FRESHMAN YEAR

	<i>Semester Hrs.</i>
ENGL 1—Composition	3
ZOOL 1 or BOTN 1—General Zoology or General Botany ...	4
SOCY 1—Introduction of Sociology	3
PSYC 1—Introduction to Psychology	3
SPCH 1—Public Speaking	3
MATH 1—Review of High School Algebra (if required)	0
APDS 1—Fundamentals of Design	3
Fine Arts Requirement	3
RECR 30—History and Introduction to Recreation	2
HLTH 40—Personal and Community Health	3
PHED 50—Rhythmic Activities	2
Physical Education Activities (60 Series, or 105-107)	4
(choice of activities depends upon student's background and interest)	
Total	33

SOPHOMORE YEAR

ENGL 3 and 4—World Literature	6
HIST 21 or 22—History of the United States	6
(and one elective History course)	
GVPT 1—American Government	3
MATH 10—Introduction to Mathematics	3
SPCH 10—Group Discussion	3
CRFT 2—Simple Crafts	2
MUSC 16—Fundamentals for the Classroom Teacher	3
RECR 40—Camp Counseling and Administration (or RECR 150, if experienced)	2
HLTH 50—First Aid and Safety	1
Science Requirement	4 (or 3)
Total	33

JUNIOR YEAR

	<i>Semester Hrs.</i>
SOCY 118—Community Organization	3
SPCH 113 or 127—Play Production or Children's Dramatics ..	3
PHED 114—Methods in Physical Education for Secondary Schools	4
RECR 100—Co-recreational Games and Programs	2
RECR 110—Naturelore	2
RECR 120—Program Planning	3
RECR 180—Leadership Techniques and Practices	3
Option requirements and electives	13
Total	33

SENIOR YEAR

HDDE 106—Study of Human Behavior	3
RECR 140—Observation and Field Work in Recreation	5
RECR 185—Planning, Design and Maintenance of Park and Recreation Areas and Facilities	3
RECR 190—Organization and Administration of Recreation ...	3
Option requirements and electives	18
Total	32

NOTE: Air Science is optional.

Swimming courses will be required only of non-swimmers.

SPCH 4, Voice and Diction, is required only of those with speech problems.

REQUIREMENTS FOR DEGREE IN RECREATION

Requirements for the Bachelor of Science degree in recreation in the College of Physical Education, Recreation, and Health are as follows:

Men and Women

College recreation courses (RECR 30, 40 or 150, 100, 110, 120, 140, 180, 185, 190)	25-26
Prescribed courses in related areas (PHED 50, 60 series—4 cr., 114; APDS 1; CRFT 2; MUSC 16, SOCY 1, 118; SPCH 1, 10, 113 or 127; PSYC 1; HDDE 106)	39
Additional prescribed courses in one recreation option area (public recreation, recreation for the ill and handicapped or outdoor recreation)	12
Prescribed Health course (HLTH 40, 50)	4
Additional General Education requirements (ENGL 9 cr.; HIST 6 cr.; Fine Arts 3 cr.; Science 7 or 8 cr.; MATH 3 cr.)	28-29
Electives (to encourage proficiency in one skill area, and provide for a minor)	22
Total	130

MINOR IN RECREATION

18 semester hours in recreation and 6 semester hours in cognate areas.

REQUIRED COURSES

- 10 hours in RECR 30, 40, 110, 120, 150, 170, 180, 185 or 190; RECR 100; SOCY 118.
- 6 hours of work in areas of the recreational skills—nature, arts and crafts, speech and dramatics—but *not* in the area of the student's major.
- 2 hours of work in the areas of swimming, sports and dance skills.
- OR other courses approved by the student's adviser and the various departments involved, depending upon the student's interest and background.

ELECTIVE COURSES

- 6 hours in cognate areas of sociology, psychology, etc., on approval of the student's adviser.

HEALTH EDUCATION

This curriculum is designed to prepare the student to give leadership in the development of the school health program including (1) health services, (2) healthful environment, and (3) health instruction. Graduates in this area have placement opportunities in schools, colleges, and in public and private health agencies. The minor is planned to be particularly suitable for students who are majoring in physical education, education, home economics, and early childhood education.

HEALTH CURRICULUM FOR MEN

FRESHMAN YEAR

	Semester	
	I	II
ENGL 1, 3—Composition and American Literature	3	3
SOCY 1—Sociology of American Life	3	..
ZOOL 1—General Zoology .....	..	4
SPCH 7—Public Speaking	2	..
PHED 1—Orientation to Physical Education	1	..
PHED 3—Developmental and Combative Sports .....	..	1
CHEM 1, 3—General Chemistry	3	3
ANTH 1—Introduction to Anthropology .....	..	3
Electives	5	3
Total	17	17

SOPHOMORE YEAR

	Semester	
	I	II
ENGL 4—World Literature .....	..	3
HIST	3	3
ZOOL 14, 15—Human Anatomy and Physiology	4	4
HLTH 40—Personal and Community Health	3	..
HLTH 50—First Aid and Safety .....	..	1
HLTH 70—Safety Education	3	..
PHIL 1—Introduction to Philosophy	3	..
MATH .....	..	3
Electives .....	..	3
Total	16	17

	Semester	
	I	II
JUNIOR YEAR		
MICB 1—General Microbiology	4	..
MICB 108—Epidemiology and Public Health .....	..	2
NUTR 20—Elements of Nutrition .....	..	3
EDUC 150—Educational Measurement or HLTH 180—Measurement in Physical Education and		
HLTH 110—Introduction to School Health Education	2	..
HLTH 120—Methods & Materials in Health Education .....	..	3
EDUC 110—Human Development and Learning	6	..
PSYC 1—Introduction to Psychology	3	..
PSYC 5—Personality and Adjustment .....	..	3
EDUC 111—Foundations of Education .....	..	3
Electives .....	..	4
Total	18	18

SENIOR YEAR

HLTH 140—Curriculum, Instruction and Observation	3	..
HLTH 150—Health Problems of Children and Youth .....	..	3
HLTH 190—Organization and Administration of School Health Programs	3	..
EDSE 145—Principles and Methods of Secondary Education	3	..
EDSE 148—Student Teaching in Secondary Schools ¹⁰	8	..
Electives .....	..	14
Total	17	17

HEALTH EDUCATION CURRICULUM FOR WOMEN

FRESHMAN YEAR

ENGL 1, 3—Composition and American Literature	3	3
SOCY 1—Sociology of American Life	3	..
ZOOL 1—General Zoology .....	..	4
SPCH 7—Public Speaking	2	..
PHED 2, 4—Orientation Activities, Swimming	1	1
CHEM 1, 3—General Chemistry	3	3
ANTH 1—Introduction to Anthropology .....	..	3
Electives	5	3
Total	17	17

¹⁰When EDSE 148 is taken, EDSE 145, HLTH 140 and HLTH 190 must be scheduled concurrently. This may be done either semester.

SOPHOMORE YEAR

	Semester	
	I	II
ENGL 4—World Literature .....	..	3
HIST	3	3
ZOOL 14, 15—Human Anatomy and Physiology	4	4
HLTH 40—Personal and Community Health	3	..
HLTH 50—First Aid and Safety .....	..	1
HLTH 70—Safety Education .....	..	3
PHIL 1—Introduction to Philosophy	3	..
MATH .....	..	3
Electives	3	..
Total	16	17

JUNIOR YEAR

MICB 1—General Microbiology	4	..
MICB 108—Epidemiology and Public Health .....	..	2
NUTR 20—Elements of Nutrition .....	..	3
EDUC 150—Educational Measurement or HLTH 180—Measurement in Physical Education and Health	3	..
HLTH 110—Introduction to School Health Education	2	..
HLTH 120—Methods and Materials in Health Education .....	..	3
EDUC 110—Human Development and Learning	6	..
PSYC 1—Introduction to Psychology	3	..
PSYC 5—Personality and Adjustment .....	..	3
EDUC 111—Foundations of Education .....	..	3
Electives .....	..	4
Total	18	18

SENIOR YEAR

HLTH 140—Curriculum, Introduction and Observation	3	..
HLTH 150—Health Problems of Children and Youth .....	..	3
HLTH 190—Organization and Administration of School Health Programs	3	..
EDSE 145—Principles and Methods of Secondary Education	3	..
EDSE 148—Student Teaching in the Secondary School ¹⁷	8	..
Electives .....	..	14
Total	17	17

¹⁷When EDSE 148 is taken EDSE 145, HLTH 140 and HLTH 190 must be scheduled concurrently. This may be done either semester.

REQUIREMENTS FOR DEGREE IN HEALTH EDUCATION

Requirements for the Bachelor of Science degree in health education in the College of Physical Education, Recreation, and Health are as follows:

<i>Men</i>	<i>Sem. Cr.</i>
Foundation science courses (ZOOL 1, 14, 15; MICR 1, 108; CHEM 1, 3)	24
General Requirements (ENGL 1, 3, 4; PHIL 1; ANTH 1; SOCY 1; HIST (6 hours); MATH (3 hours))	27
Other specified requirements (SPCH 7; PSYCH 1, 5; NUTR 20)	11
Professional Health Education courses (40, 50, 70, 110, 120, 140, 150; EDUC 150, or HLTH 180; HLTH 190)	25
EDUC courses (EDUC 110, 111; EDSE 145, 148)	20
University requirements in physical activity (PHED 1, 3)	2
Electives	21
Total	130

<i>Women</i>	
Foundation science courses (ZOOL 1, 14, 15; MICB 1, 108; CHEM 1, 3)	24
General Requirements ENGL 1, 3, 4; PHIL 1; ANTH 1; SOCY 1; HIST (6 hours); MATH (3 hours))	27
Other specified requirements (SPCH 7; PSYC 1, 5; NUTR 20)	11
Professional Health Education courses (40, 50, 70, 110, 120, 140, 150; EDUC 150, or HLTH 180; HLTH 190)	25
Education courses (EDUC 110, 111; EDSE 145, 148)	20
University requirements in physical activity (PHED 2, 4)	2
Electives	21
Total	130

MINOR IN HEALTH EDUCATION

12 semester hours in health education and 12 semester hours in related areas.

REQUIRED COURSES

HLTH 40 (3), HLTH 50 (1), HLTH 110 (2), HLTH 120 (3) and HLTH 150 (3).

ELECTIVE COURSES IN RELATED AREAS

6 semester hours of biological sciences and 6 semester hours of psychology or human development.

MINOR IN SAFETY EDUCATION

Students wishing to obtain a minor in safety education and become certified to teach Safety and Driver Education in junior and senior high schools should take the following courses: HLTH 50 (1), HLTH 60 (2), HLTH 70 (3), HLTH 80 (3), HLTH 105 (3), and HLTH 145 (3), ENFP 104 (3) and ENFP 105 (3). In addition, six hours of psychology (other than the general education requirements) are required.

MINORS IN OTHER AREAS

It is relatively easy for any student majoring in one curriculum of this College to complete the requirements for a minor in a cognate area of the College, as indicated after each major curriculum. Those who plan to teach in the public schools might wish to also qualify in another area. This is more difficult with the limited number of elective credits and must be planned carefully in advance. If it seems advisable, the Dean may waive certain required courses to allow development of a needed minor, or the student may be able to carry a heavier load than normal if his grade average permits.

Students majoring in physical education or health education should begin preparing for a teaching minor in a subject matter area during the sophomore year, if possible. Many opportunities exist in junior and senior high schools for a combination teacher of physical education and/or coach and a teacher of science, mathematics, history, etc. For a teaching minor, EDUC 140 should be taken in the minor field and student teaching should be split between the major and minor fields.

ENGLISH MINOR

A minor in English requires 23 semester hours. It includes 9 semester hours of composition and literature, 3 semester hours of advanced American Literature, and 11 hours of electives. Electives must be chosen with the approval of the adviser and with the recommendations of the English Department.

MATHEMATICS MINOR

Two options should be noted for those desiring to take a concentration in math. If a person scored in Category 1 of the Math Placement Test, he should follow option 1—if he scored in Category 2, he should follow option 2.

<i>Option 1</i>		<i>Option 2</i>	
MATH 18	3 hrs	MATH 10	3
MATH 19	4	MATH 11	3
MATH 20	4	MATH 14	3
MATH 21	4	MATH 15	3
MATH 100	3)	MATH 100	3)
MATH 133	3) any one	MATH 133	3) any one
MATH 170	4)	MATH 170	4)
<hr/>		<hr/>	
18-19		15-16	

PSYCHOLOGY MINOR

For a minor in Psychology at least 21 semester hours are required. The student should select the biological or the sociological approach to this minor.

- A. Biological: Psychology 1, Introduction to Psychology (3); Psychology 26, Developmental Psychology (3); Psychology 90, Statistical Methods in Psychology (3); Psychology 145, Experimental Psychology—Sensory Processes (4); Psychology 146, Experimental Psychology—Learning, Motivation and Problem Solving (4); Psychology 148, Psychology of Learning (3); Psychology 180, Physiological Psychology (3).
- B. Sociological: Psychology 1, Introduction to Psychology (3); Psychology 5, Personality and Adjustment (3); Psychology 21, Social Psychology (3);

Psychology 26, Developmental Psychology (3); Psychology 90, Statistical Methods in Psychology (3); Psychology 147, Experimental Psychology—Social Behavior (4); Psychology 148, Psychology of Learning (3).

SOCIAL SCIENCE MINOR

For a minor in this group, 24 semester hours are required as follows: History, 18 semester hours (including one year each of American and European history), economics, sociology, government, consumer education or geography, 6 semester hours.

SCIENCE MINORS

- A. General Science: 30 semester hours are required for a minor in general science including the following courses: CHEM 1, 3, General Chemistry (4, 4); ZOOL 1, General Zoology (4); BOTN 1, General Botany (4); PHYS 1, 2, Elements of Physics (3, 3) or PHYS 10, 11, Fundamentals of Physics (4, 4). The remaining 6 or 8 semester hours will be chosen subject to the approval of the student's major adviser and of the science department in which his interest lies. ZOOL 14 and 15 (4, 4) are approved courses.
- B. Biological Minor: 20 semester hours are required for a biological minor and will include the following courses: ZOOL 1, General Zoology (4); ZOOL 14, and 15, Human Anatomy and Human Physiology (4, 4); CHEM 1, General Chemistry (4); BOTN 1, General Botany (4).
- C. Minors of 20 semester hours are also offered in chemistry and physics. A minor in chemistry must be supported by a one-year course in physics. Other courses will be chosen subject to the approval of the student's major advisor and the science department in which the student's interest lies.

SOCIOLOGY MINOR

For a minor in Sociology a least 18 semester hours are required as follows: Sociology 1, Introduction to Sociology; Sociology 2, Principles of Sociology (3); three semester hours chosen from Sociology 112, Rural-Urban Relations (3), Sociology 114, The City (3), Sociology 118, Community Organization (3), Anthropology (3) or Sociology 105, Cultural Anthropology (3); three semester hours chosen from a social psychology group—sociology 141, Sociology of Personality (3), Sociology 145, Social Control (3), Sociology 180, Small Group Analysis (3); and three semester hours from an applied sociology group—Sociology 111, Sociology of Occupations and Careers (3), Sociology 115, Industrial Sociology (3), Sociology 116, Military Sociology (3), Sociology 121, Population (3), Sociology 131, Introduction to Social Service (3), 147 Sociology of Law (3), Sociology 153, Juvenile Delinquency (3), Sociology 186, Sociological Theory (3).

SPEECH MINOR

A minor of 22 semester hours is offered in speech. The minimum requirements for this minor are 12 semester hours in addition to the 10 semester hours of departmental requirements in Speech 1, 2, 3, and 4. The 12 semester hours above the departmental requirements must include 6 semester hours of courses numbered 100 or higher. All programs for minors must be approved by the departmental adviser.

Graduate Study

The College of Physical Education, Recreation, and Health offers course work in the areas of physical education, recreation and health education leading to the degree of Master of Arts, Doctor of Education, and Doctor of Philosophy. Persons not interested in an advanced degree may take course work for purposes of teaching certification, renewal of certification, or professional growth. Within the three major areas—physical education, recreation, and health education—special study and research are available along the following lines: (1) Physical Education—elementary, secondary, higher education and research, administration, athletics, and dance; (2) Recreation—public, industrial, hospital, youth-serving organizations and agencies, outdoor education, camp administration, higher education and research; (3) Health Education—elementary, secondary, higher education and research, safety education, and service organizations and agencies.

Special Study

Graduate students are encouraged to pursue advanced study along lines of their special interests. The wealth of research sources close to the University makes such study possible. In addition, the College of Physical Education, Recreation, and Health places at the disposal of graduate students a modern, spacious, well-equipped research laboratory.

General Regulations Governing Graduate Work

Persons wishing to pursue graduate study must first gain admittance to the Graduate School. Application blanks for this purpose can be obtained by writing to the Dean of the Graduate School. Admittance to Graduate School entitles one to enroll in courses numbered 200 and above and to pursue course work leading to an advanced degree. Courses numbered 200 or above are graduate courses whereas courses numbered from 100 to 199 are advanced undergraduate and graduate courses. Persons not admitted to the Graduate School may enroll as special students in courses numbered under 200. To be admitted for graduate study, the applicant must:

- (1) be a graduate of an accredited college or university.
- (2) have a "B" average or its equivalent during the last two years of undergraduate work.
- (3) have the necessary prerequisite course work with a minimum of 16 semester credit hours in the subject field in which the applicant wishes to specialize.

Master of Arts Degree

The Master of Arts degree is awarded for successful completion of a minimum of 30 hours of advanced study beyond the undergraduate level. The Master's degree represents more than mere class attendance. It represents professional competency and the demonstrated ability to do critical thinking.

The student seeking the Master of Arts degree must declare a major subject field and a minor subject field. Twelve to fifteen credit hours will be in the major area and nine to twelve hours, depending upon the number in the major area, will be in the minor field. The remaining six hours are made available to the student in order that he may study, relatively intensely, any problem or topic in which he has a *special* interest. This study culminates in a thesis.

The program of the Master's degree is relatively flexible with only one course, (PHED 210, RECR 210, or HLTH 210), three credit hours, being required. All other course work is elective, subject to the adviser's approval. The student, in conjunction with the help of an adviser, works out a program of study suitable to the student's special needs and interests. During the term of initial enrollment in graduate study, the student takes the Graduate Diagnostic Examination. The purpose of this examination is to help the student and adviser to discover areas of strength and weakness. This provides information needed in directing the course of study. Upon completion of all course work, including the research project, the candidate undergoes a final oral examination which is directed primarily toward the student's research.

Graduate assistants working toward the Master's Degree should note that they may take only ten credit hours per semester during the fall and spring terms and six credit hours in Summer School. Consequently, a graduate assistant in order to obtain the Master's Degree, must attend the University at least three full semesters, or two semesters and two summer sessions.

The Doctor of Education Degree

The Doctor of Education degree is a professional degree offered in conjunction with the College of Education. Persons who are interested primarily in administrative and teaching positions in public school and related fields are encouraged to pursue this degree.

The degree is awarded for successful completion of a minimum of 90 hours of graduate credit and a demonstrated competency in the study and solution of problems related to the student's field of endeavor.

At least 30 class hours of the minimum of 90 hours must be taken on the College Park campus. The number of hours that can be transferred from another institution is subject to the decision of the Graduate Council. Each student is expected to select and carry to successful completion a research project of particular interest to him. This project is reported in the form of a thesis and may carry from six to nine hours of credit. In addition, each student must satisfy the language requirement by selecting Option I or IV. For detailed information concerning Options I or IV refer to the Office of Coordinator of Graduate Studies for the College.

In pursuing the Doctor of Education degree, the candidate must select an area of major emphasis and one or two areas of minor emphasis. Each candidate must take certain graduate background tests, and must successfully pass the fol-

lowing academic examinations: a six-hour preliminary examination taken relatively early in the program, a final written comprehensive examination covering the entire graduate course of study, and a final oral or written examination directed primarily toward the research project.

The Doctor of Philosophy Degree

The Doctor of Philosophy degree is offered primarily for those persons interested in preparing themselves for positions in teaching and research on the college and university level. A *minimum* of 90 credit hours is required for this degree, plus the demonstrated ability to do scholarly work and research. At least thirty of the 90 hours must be taken on the College Park campus and the amount of credit that can be transferred from other institutions is subject to the decision of the Graduate Council. Each student must select and carry to completion a research project which may carry from 12 to 18 hours of credit. Course work must be planned on the basis of a major subject field and one or two closely related minor subject fields. In addition to class work, the student must satisfy the language requirement by selecting and completing Option I or IV. For detailed information concerning Options I and IV, refer to the office of the Coordinator of Graduate Studies for the College.

In pursuing the Doctor of Philosophy degree, the candidate must select an area of major emphasis and one or two areas of minor emphasis. Each candidate must take certain background tests, and must successfully pass the following academic examinations; a six-hour preliminary examination taken relatively early in the program, a final written comprehensive examination covering the entire graduate course of study, and a final oral or written examination directed primarily toward the research project.

Doctoral Residence

The requirements of residency for both the Ed.D. and Ph.D. candidates can be fulfilled by presence on the campus for two semesters during the fall and spring terms. In unusual circumstances, the time may be prorated over more than two semesters.

General Advanced Study

Students who are not seeking a degree, but are doing advanced study to fulfill some special need or renewal of teaching certification, are encouraged to select an adviser and to plan a program designed to help them best achieve their objectives.

Prerequisite for Advanced Study

The course prerequisite for advanced study in each of the three areas, physical education, recreation, and health are listed below. In certain instances experience or equivalent courses may be substituted for the courses listed. Students who are deficient in only one or two subjects may be admitted on a provisional

basis, with the understanding that the deficiencies will be made up as soon as possible.

The following courses, or their equivalents, are prerequisites for advanced study:

- A. Physical Education—human anatomy, physiology, history and principles of physical education, theory of exercise (physiology of exercise), kinesiology, adapted physical education, measurement, methods, activity skills, administration, practice teaching (teaching experience), and human development (educational psychology).

Note: Measurement, administration, kinesiology and theory of exercise may be taken for graduate credit if they have not been taken on the undergraduate level. The student is expected to carry out a special research project if an advanced undergraduate course (100 level), is to carry graduate credit. No more than four hours of credit may count toward the M.A. degree.

- B. Recreation-psychology, sociology, principles of recreation, administration, recreation skills and leadership techniques.
- C. Health Education—biological sciences, bacteriology, human anatomy, physiology, chemistry, psychology, mental health, measurement, administration, nutrition, school health and field work.

Graduate Assistantships

A number of teaching resident and research assistantships are available to qualified individuals. These assistantships carry a stipend of \$2,700 for the academic year, and exemption from all fixed charges. Graduate assistants may carry up to ten hours of academic work. Persons interested in an assistantship should write directly to Dean L. M. Fraley, College of Physical Education, Recreation, and Health.

Persons interested in additional information concerning the graduate program should refer to the Graduate School Announcements.

Course Offerings

The University reserves the right to withdraw or discontinue any course for which an insufficient number of students have registered to warrant giving the course. In such an event, no fee will be charged for transfer to another course.

Courses are designated by numbers as follows:

1 to 99: courses for undergraduates.

100 to 199: courses for advanced undergraduates and graduates.

200 to 299: courses for graduates only.

A separate schedule of courses is issued each semester, giving the hours, places of meeting, and other information required by the student in making out his program. Students obtain these schedules when they register.

PHYSICAL EDUCATION

PHED 30. INTRODUCTION TO PHYSICAL EDUCATION, RECREATION, AND HEALTH. (2)

First and second semesters. Development of understanding and appreciation of the historic and significant purpose and place of each of the specialized areas in general education. A study of the educational and personal requirements and opportunities of a career in each professional area. Students will become acquainted with the status and trends of each area.

PHED 40w. FUNDAMENTALS OF MOVEMENT. (2)

First and second semester—three hours a week. Introduction to analysis of muscular activity; conditioning exercises and programs; improvement of physical fitness; mechanical principles related to sports activities.

PHED 50. RHYTHMIC ACTIVITIES. (2)

First and second semester. Lab. three hours a week. Development of rhythmic sensitivity through an analysis of rhythm and its application to movement, skills in folk, square and social dance, teaching techniques for use in schools and recreational programs.

PHED 55. ELEMENTARY SCHOOL RHYTHMIC ACTIVITIES. (2)

First and second semesters. Summer session. This course surveys the various types of rhythmic activities suitable for use in the elementary school. Basic rhythms, singing games, and folk and square dancing are considered in terms of their use at the various grade levels as well as the best accepted methods of teaching these activities.



PHED 57. ELEMENTARY SCHOOL SKILLS AND SELF-TESTING ACTIVITIES. (2)

First and second semesters and summer. This course surveys the various types of skills and stunt and tumbling activities suitable for use in the elementary school. These activities are considered in terms of their use at the various grade levels as well as the best accepted methods of teaching.

PHED 61, 63. SKILLS LABORATORY. (2, 2)

First and second semesters. Six hours a week. Progressive techniques and practice of skills in apparatus, calisthenics, cross-country, dual recreation activities, mass games and relays, soccer, touch football, track, tumbling, and volleyball.

PHED 62, 64. SKILLS LABORATORY. (2, 2)

First and second semesters. Six hours a week. Progressive techniques and practice of seasonal sports, stunts, tumbling, and gymnastic exercises.

PHED 65, 67. SKILLS LABORATORY. (2, 2)

First and second semesters. Six hours a week. Progressive techniques and practice of skills in basketball, baseball, football and wrestling.

PHED 66, 68. SKILLS LABORATORY. (2, 2)

First and second semesters. Six hours a week. Prerequisites, PHED 40, 62, 64. Techniques of selected team and individual sports.

PHED 69. SKILLS LABORATORY. (2)

First and second semesters. Three hours a week. Prerequisite, PHED 61. Provides experience in complex gymnastic activities above the elementary phase.

PHED 71. ELEMENTARY SWIMMING. (1)

First and second semesters. Progressive techniques and practice of elementary swimming. Course includes basic and intermediate swimming instruction.

PHED 72w. ELEMENTARY SWIMMING AND DIVING. (1)

First and second semesters. Three hours a week. Progressive techniques and practice in the elementary phase of swimming and diving, designed to make the student self-sufficient in deep water.

PHED 73. ADVANCED SWIMMING. (1)

First and second semesters. Prerequisite, PHED 71, or equivalent. Progressive techniques and practice of advanced swimming skills, water stunts and survival swimming.

PHED 74w. INTERMEDIATE SWIMMING AND DIVING. (1)

First and second semesters. Three hours a week. Prerequisite, PHED 72, or equivalent. Continuation of the techniques in PHED 72 to include proficiency in the standard swimming strokes and the ability to perform a fully coordinated standing dive.

PHED 75. LIFE SAVING AND WATER SAFETY. (1)

First and second semesters. Three hours a week. Prerequisites, PHED 73, or equivalent. Progressive techniques and practice of life saving and water safety skills. Course includes the Senior Life Saving material of the American Red Cross and the Y.M.C.A. It is possible to secure the American Red Cross Water Safety Instructorship through this course.

PHED 76w. ADVANCED SWIMMING AND LIFE SAVING. (1)

First and second semester—three hours a week. Prerequisite, PHED 74 or

equivalent. American Red Cross Senior Life Saving, advanced swimming strokes, and diving.

PHED 77mw. METHODS OF AQUATICS. (2)

First and second semesters. Three hours a week. Prerequisites, PHED 73, or equivalent. This course is designed to train students for aquatic leadership in schools, camps and clubs. Course includes teaching methods, administration, facilities and equipment.

PHED 78w. WATER SAFETY. (1)

First and second semester—three hours a week. Prerequisites, Current American Red Cross Senior Life Saving certificate, or successful completion of PHED 76 or equivalent. This course is designed to prepare students to teach swimming and life saving and enable students to secure the American Red Cross Water Safety Instructorship.

PHED 79. FANCY DIVING. (1)

First and second semesters. Three hours a week. Progressive techniques and practice of fancy diving. Course will include work on the five categories of dives.

PHED 82w. ORGANIZATION AND ADMINISTRATION OF INTRAMURALS. (1)

First and second semester—three hours a week. Organization and administration of intramural programs, tournaments, techniques of officiating women's sports. Opportunity to qualify for officials' ratings in hockey and basketball.

*For Advanced Undergraduates and Graduates*¹⁹

PHED 100. KINESIOLOGY. (4)¹⁹

First and second semesters. Summer session. Three lectures and two laboratory hours a week. Prerequisites, ZOOL 1, 14, and 15, or the equivalent. The study of human movement and the physical and physiological principles upon which it depends. Body mechanics, posture, motor efficiency, sports, the performance of atypical individuals, and the influence of growth and development upon motor performance are studied.

PHED 101, 103. ORGANIZATION AND OFFICIATING IN INTRAMURALS. (1, 1)

First and second semesters. Six hours a week. Organizations, administration, and promotion of intramurals at various school levels. Types of tournaments, units of competition, handling of student leader personnel, etc.

PHED 105, 107. SKILLS LABORATORY. (2, 2)

First and second semesters. Four hours a week. Prerequisite, junior standing. Open to male students preparing for teaching. Experienced in individual and dual neuro-muscular sports skills for the physical education major student.

PHED 114. METHODS IN PHYSICAL EDUCATION FOR SECONDARY SCHOOLS. (4)

First and second semesters. Three lectures and a lab. each week. Application of educational philosophy and principles to class organization and teaching techniques in individual sports, recreational games, gymnastics, body mechanics, and dance for junior and senior high school programs.

¹⁹This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

PHED 120. PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL. (3)²⁰

First and second semesters. Summer session. This course is designed to orient the general elementary teacher to physical education. Principles and practices in elementary physical education will be presented and discussed and a variety of appropriate activities will be considered from the standpoint of their use at the various grade levels.

PHED 123, 125, 126. COACHING ATHLETICS. (2, 2, 2)

First and second semesters. Two lectures and two laboratory hours a week. Theory of coaching the various competitive sports commonly found in high school and college programs.

PHED 124W. COACHING ATHLETICS. (2)

First and second semester—three hours a week. Theory and practice of coaching competitive sports found in high school and community recreational programs.

PHED 130. FUNDAMENTALS OF BODY DYNAMICS. (3)

First and second semesters. Summer session. This course is designed to acquaint the elementary teacher with the scientific principles of mechanical-anatomical analysis and physiology of activities as they relate to physical growth and development.

PHED 133. ADAPTED PHYSICAL EDUCATION. (2)

First and second semesters. Lecture and lab. Prerequisites, PHED 100 Kinesiology or equivalent. Application for kinesiological and physiological principles to handicapped students; designed to help prospective teachers meet exercise needs of those pupils with disabilities which require special handling.

PHED 135. COACHING SWIMMING AND DIVING. (2)

First and second semesters. Three hours a week. A thorough analysis of the techniques of coaching swimming and diving. Course includes systematic treatment of the philosophy, historical development and psychological theories of coaching aquatics.

PHED 155. PHYSICAL FITNESS OF THE INDIVIDUAL. (3)²⁰

First and second semesters. Summer session. A study of the major physical fitness problems confronting the adult in modern society. Consideration is given to the scientific appraisal, development and maintenance of fitness at all age levels. Such problems as obesity, weight reduction, chronic fatigue, posture, and special exercise programs are explored. This course is open to persons outside the fields of Physical Education and Health.

PHED 160. THEORY OF EXERCISE. (3)²¹

First and second semesters. Summer session. Two lectures and two laboratory hours a week. Prerequisite, ZOOL 1, 14, and 15, and PHED 100 or the equivalent. A study of exercise and its physiological and kinesiological bases. Special

²⁰This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

²¹This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

emphasis is placed upon the application of exercise to the development and maintainance of physical efficiency. Corrective therapy, conditioning for athletics, the effects of exercise and training on the human organism, fatigue, staleness, relaxation, and the nature of athletic injuries are investigated.

PHED 170. SUPERVISION IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)²¹

First and second semesters. Summer session. Prerequisite, PHED 120. Principles and techniques of supervision are studied from a standpoint of their application in improving the learning situation in elementary school physical education. Strong emphasis will be given to the concept that modern supervision in elementary school physical education should be based on the application of fundamental democratic principles.

PHED 180. MEASUREMENT IN PHYSICAL EDUCATION AND HEALTH. (3)²¹

First and second semesters. Summer session. Two lectures and two laboratory periods a week. Prerequisite, placement in Group 1 or 2 on Mathematics Entrance test or MATH 0. The application of the principles and techniques of educational measurement to the teaching of health and physical education; study of the functions and techniques of measurement in the evaluation of student progress toward the objectives of health and physical education, and in the evaluation of the effectiveness of teaching.

PHED 181. ADVANCED TRAINING AND CONDITIONING. (3)

Second semester. Two lectures and two laboratory hours a week. Prerequisites, ZOOL 14, 15 and PHED 100. The training and physical conditioning of athletics. Treatment of athletic injuries by taping, massage, hydro-therapy, physical therapy, and electro-therapy. Remedial and conditioning exercises. Theory and practice.

PHED 187. PHYSICAL EDUCATION AND SPORT IN CONTEMPORARY CULTURES. (3)²¹

First and second semesters. Prerequisite, SOCY 1 or SOCY 5 or equivalent. Three lectures per week. A study will be made of the cultural impact of physical education activities in the United States and selected countries. Individual research on selected topics will be required.

PHED 189. FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)²¹

First and second semesters. Summer session. A course designed to meet the needs of persons in the field with respect to workshops and research projects in special areas of knowledge not covered by regularly structured courses.

Note: The maximum total number of credits that may be earned toward any degree in Physical Education, Recreation, or Health Education under PHED, RECR, HLTH, or EDUC 189 is six.

PHED 190. ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION, AND HEALTH. (3)²²

First and second semesters. Summer session. The application of the principles of administration and supervision to Physical Education, Recreation, and Health. This course must be taken during the semester in which the student is doing student teaching.

PHED 191. THE CURRICULUM IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)²²

First and second semesters. One lecture and two laboratory hours per week. Techniques planning and construction is considered from a standpoint of valid criteria for the selection of content in elementary school physical education. Desirable features of cooperative curriculum planning in providing for learning experiences will be presented and discussed.

PHED 193. HISTORY AND PHILOSOPHY OF SPORT AND PHYSICAL EDUCATION. (3)²²
First and second semesters. History and philosophical implications of sport and physical education through ancient medieval, and contemporary periods in western civilization.

PHED 195. ORGANIZATION AND ADMINISTRATION OF ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)²²

First and second semesters. Summer session. Prerequisite, PHED 120. This course considers the procedures which are basic to the satisfactory organization of all phases of the elementary school physical education program. Stress will be placed on the organizational and administrative factors necessary for the successful operation of the program in various types of elementary schools. Strong emphasis will be placed on organization and administration from a standpoint of adapting the program to specific situations.

PHED 196. QUANTITATIVE METHODS. (3)²²

First and second semesters. Summer session. A course covering the statistical techniques most frequently used in research pertaining to Physical Education, Recreation, and Health Education. An effort will be made to provide the student with the necessary skills, and to acquaint him with the interpretations and practical applications of these techniques.

PHED 198H. HONORS SEMINAR. (1)

First and second semesters. Prerequisites, participation in honors program. One discussion period a week. Guided discussion of research topics of current interest. Repeatable to a total of 3 hours credit.

PHED 199H. HONORS THESIS. (3)

First and second semester. Prerequisites, PHED 198H and candidacy for honors in Physical Education. Advise ment will be on an individual basis. Thesis must be defended in the Honors Seminar.

For Graduates

PHED 200. SEMINAR IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (1)

First and second semesters. Summer session.

PHED 201. FOUNDATIONS IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (3)

First and second semesters. Summer session. A study of history, philosophy and principles of physical education, recreation and health as applied to current problems in each area and as related to general education.

PHED. 202. STATUS AND TRENDS IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)

First and second semesters. Summer session. An analysis of the current status and implications for future trends in physical education at the elementary school level. Open to experienced persons in all phases of education.

PHED 203. SUPERVISORY TECHNIQUES IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (3)

First and second semesters. Summer session. A study of current concepts, principles and techniques of supervision and of their application to the special fields indicated; observation of available supervisory programs and visits with local supervisors; practice in the use of selected techniques.

²²This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

PHED 204. PHYSICAL EDUCATION AND THE DEVELOPMENT OF THE CHILD. (3)

First and second semesters. Summer session. An analysis of the place of physical education in meeting the growth and developmental needs of children of elementary school age.

PHED 205. ANALYSIS OF CONTEMPORARY ATHLETICS. (3)

First and second semesters. Summer session. A study of current problems, practices and national issues of permanent importance to the conduct of athletic competition in a democracy.

PHED 210. METHODS AND TECHNIQUES OF RESEARCH. (3)

First and second semesters. Summer session. A study of methods and techniques of research used in Physical Education, Recreation, and Health Education; an analysis of examples of their use; and practice in their application to problems of interest to the student.

PHED 215. PRINCIPLES AND TECHNIQUES OF EVALUATION. (3)

First and second semesters. Summer session. Prerequisite, an introductory course in measurement or permission of the instructor. A study of currently used means of evaluating the performance of students and the effectiveness of programs of physical education in schools and colleges. Specific problems concerning evaluation, brought in by members of the class, will be analyzed.

PHED 230. SOURCE MATERIAL SURVEY. (3)

First and second semesters. Summer session. A library survey course, covering the total areas of Physical Education, Recreation, and Health, plus research in one specific limited problem of which a digest, including a bibliography, is to be submitted.

PHED 250. MENTAL AND EMOTIONAL ASPECTS OF SPORTS AND RECREATION. (3)

First and second semesters. Summer session. Prerequisites, psychology and/or human development. An exploration of psychological aspects of physical education, sports and recreation, including personality dynamics in relation to exercise and sports, psychological factors in athletic performance and coaching, and applications of principles of motor learning.

PHED 275. ADVANCED ANALYSIS OF HUMAN MOTION. (3)

First and second semesters. Summer session. Prerequisites, PHED 100, 160, College algebra or equivalent or by permission of instructor. A research oriented kinesiological analysis of human movement as it relates to sports and the activities of daily living. The analysis is accomplished by means of various measurement procedures including cinematography, electronic timing devices and similar instruments.

PHED 280. SCIENTIFIC BASES OF EXERCISE. (3)

First and second semesters. Summer session. Prerequisites, Anatomy, Physiology, PHED 100, 160, or equivalent. A critical analysis of the role of physical exercise in modern society with attention given to such topics as: the need for physical exercise, its chronic effects, the role of exercise in attaining good physical condition and fitness, factors determining championship performances, and physical fatigue.

PHED 287. ADVANCED SEMINAR. (1-3)

First and second semesters. Summer session. Prerequisite, PHED 201, or HLTH 220, or equivalent, or permission of the instructor. This course is a study of the current problems and trends in the selected fields of Physical Education, Recreation, and Health.

PHED 288. SPECIAL PROBLEMS IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (1-6)

First and second semesters. Summer session. Master or doctoral candidates who desire to pursue special research problems under the direction of their advisors may register for 1-6 hours of credit under this number.

PHED 290. ADMINISTRATIVE DIRECTION OF PHYSICAL EDUCATION, RECREATION, AND HEALTH. (3)

First and second semesters. Summer session. This course is devoted to the analysis of administrative problems in the light of sound educational practice. Students concentrate their efforts upon their own on-the-job administrative problems and contribute to the solution of other class members' problems.

PHED 291. CURRICULUM CONSTRUCTION IN PHYSICAL EDUCATION. (3)

First and second semesters. Summer session. A study of the principles underlying curriculum construction in Physical Education and the practical application of these principles to the construction of a curriculum for a specific situation. The specific content of this course is adjusted to meet the needs of the students enrolled in it.

PHED 399. RESEARCH—THESIS. (1-5)

First and second semesters. Summer session. Students who desire credits for a master's thesis, a doctoral dissertation, or a doctoral project should use this number.

RECREATION

RECR 30. HISTORY AND INTRODUCTION TO RECREATION. (2)

First and second semesters. An introduction to the beginnings, growth, and possibilities in recreation as presently conducted by individuals, agencies and governments; attitudes toward and theories of play; historical events and figures; organizations and groups interested in recreation, including their job opportunities, specifications and demands; a self analysis of individual student interests, limitations and capabilities in light of these specifications and demands.

RECR 40. CAMP COUNSELING AND ADMINISTRATION. (2)

First and second semesters. A study of the philosophy and techniques of camp counseling including the qualifications, responsibilities and skills involved; the basic organization, administration and program planning practices and problems of camping as a whole; the relationship of these practices and problems to the counselor and his or her probable success. Outdoor skills will be taught and practiced insofar as possible with field trips included.

For Advanced Undergraduates

RECR 100. CO-RECREATIONAL GAMES AND PROGRAMS. (2)

First and second semesters. Compilation and sampling of the techniques for use in low organization and party games and activities. Emphasis is placed upon those activities of value to a recreation leader or teacher, and upon the placement, sequence and variation of such activities for all age levels and interests.

RECR 110. NATURE LURE. (2)

Second semester. An overall orientation course in nature interpretation covering from a recreational point of view, the various areas of the physical and biological sciences. Students will be required to attend evening classes, carry out various observations, and participate in practice-leadership experiences as scheduled.

RECR 120. PROGRAM PLANNING. (3)²³

First and second semesters. Prerequisite, RECR 30 or RECR 170. Study of the various aspects, problems and practices of agency, military, 'exceptional' and governmental recreation programs and their planning (with particular emphasis on playground, community and teen center plans and procedures). Observations will be required.

RECR 140. OBSERVATION AND FIELD WORK IN RECREATION. (5)

First and second semesters. Limited to recreation majors. Appropriate observations and field work placement will be selected and assigned on the basis of the student's interest and future employment plans. The field work experience itself will be expected to provide, (1) face to face leadership activity, (2) participation in staff activities and responsibilities as feasible (filing, making of reports, etc.), and (3) exposure to any and all intra and inter agency or department relationships and activities (budget hearings, training sessions, board meetings, etc.).

RECR 150. CAMP MANAGEMENT. (3)²⁴

First and second semesters. Summer session. Prerequisite: RECR 40 or experience. An advanced camping course for those students with previous training and experience; organization, administration, programming, current trends, evaluation, and special problems. Whenever possible, visiting specialists and field trips will be included.

RECR 170. GENERAL FUNDAMENTALS OF RECREATION. (3)

First and second semesters. This course is designed for and limited to students *not* majoring in recreation who wish to develop some understanding of the place, importance and potentialities of recreation in modern life. Included will be limited study of the areas of philosophy, program planning, leadership techniques, organization and administration, and interrelationships with other fields.

RECR 180. LEADERSHIP TECHNIQUES AND PRACTICES. (3)²⁴

First and second semesters. Prerequisite: RECR 30 or 170. A study of the various kinds and levels of leadership exerted by professional and volunteer

²³ This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level course for graduate credit will be expected to carry out a special project.

²⁴ This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

workers, some of the difficulties and probable weaknesses to be met, and some of the tangible techniques to be used in personnel, staff, and public relationships. The group work approach will be emphasized and used, insofar as possible, in the solution of particular problems that grow out of required field experiences in handling on or off campus groups.

RECR 184. OUTDOOR EDUCATION. (6)

First and second sessions. Summer session. Field experience in an outdoor setting will be used to present the activities and techniques recommended for modern outdoor education practice. Where possible groups of participants will be utilized as subjects for practice instructional work class. Activity will emphasize not only the subject matter of science and education but also the broad concepts of conservation, worthy use of leisure time, education for democratic living, etc.

RECR 185. PLANNING, DESIGN, AND MAINTENANCE OF PARK AND RECREATION AREAS AND FACILITIES. (3)²⁴

First and second semesters. A study of the relation of the park and recreation system to the total community planning process; area layout, design and maintenance of facilities. Field experience will include the conducting of actual community surveys and preparation of site plans as requested by various community groups. The development of such studies will include inspection of areas, site analysis, preparation of plans, and their presentation to the community.

RECR 189. FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)²⁴

First and second semesters. Summer session. A course designed to meet the needs of persons in the field with respect to workshops and research projects in special areas of knowledge not covered by regularly structured courses.

RECR 190. ORGANIZATION AND ADMINISTRATION OF RECREATION. (3)²⁴

First and second semesters. Summer session. A study of the organizational patterns and administrative problems involved in the various types of operating recreation groups and agencies; forms of organization; finance and budget; personnel; areas, facilities, and equipment; public relations.

RECR 196. QUANTITATIVE METHODS. (3) ²⁴

First and second semesters. Summer session. A course covering the statistical techniques most frequently used in research pertaining to physical education, recreation and health education. An effort will be made to provide the student with the necessary skills, and to acquaint him with the interpretations and practical applications of these techniques.

²⁴ This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

For Graduates

RECR 200. SEMINAR IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (1)
First and second semester. Summer session.

RECR 202. PHILOSOPHY OF RECREATION. (2)
First and second semesters. Summer session. A study of the meanings, relationships, and services of recreation as expressed by past and present authorities and leaders. This course should be of interest to people active in education, social work and related fields.

RECR 204. MODERN TRENDS IN RECREATION. (3)
First and second semesters. Summer session. A study of emphases and recent developments in the recreation field as a whole and within its various specialized areas, making particular reference to the current and new literature.

RECR 210. METHODS AND TECHNIQUES OF RESEARCH. (3)
First and second semesters. Summer session. A study of methods and techniques of research used in Physical Education, Recreation, and Health Education; an analysis of examples of their use; and practice in their application to problems of interest to the student.

RECR 240. INDUSTRIAL RECREATION. (3)
First and second semesters. Summer session. An introductory study of the philosophy of and practices and problems in industrial recreation. Where possible the course will include opportunities for observation and visiting specialists.

RECR 260. HOSPITAL RECREATION. (3)
First and second semesters. Summer session. An introductory study of the philosophy of and practices in hospital and institutional recreation. Where possible the course will include opportunities for observation and visiting specialists.

RECR 287. ADVANCED SEMINAR. (1-3)
First and second semesters. Summer session. Prerequisite, permission of the instructor. This course permits advanced and intensive study of specific and selected problems in recreation.

RECR 288. SPECIAL PROBLEMS IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (1-6)
First and second semesters. Summer session. Master or doctoral candidates who desire to pursue special research problems under the direction of their advisers may register for 1-6 hours of credit under this number.

RECR 399. RESEARCH—THESIS. (1-5)
First and second semesters. Summer session. Students who desire credits for a master's thesis, a doctoral dissertation, or doctoral projects should use this number.

HEALTH EDUCATION

HLTH 10. ORIENTATION TO HEALTH EDUCATION. (1)

First and second semesters. This course explores the field of health education in both the school and the community from the point of view of the health educator. Professional preparation and career opportunities are considered.

HLTH 30. INTRODUCTION TO PHYSICAL EDUCATION, RECREATION, AND HEALTH. (3)

First and second semesters. Development of understanding and appreciation of the historic and significant purpose and place of each of the specialized areas in general education. A study of the educational and personal requirements and opportunities of a career in each professional area. Students will be acquainted with the status and trends of each area.

HLTH 40. PERSONAL AND COMMUNITY HEALTH. (3)

First and second semesters. Summer session. Meaning and significance of physical, mental and social health as related to the individual and to society; important phases of national health problems; constructive methods of promoting health of the individual and the community; health problems young people encounter with special emphasis on health knowledge for future teachers. (Cannot be taken as an elective by students having had Health 5.)

HLTH 50. FIRST AID AND SAFETY. (1)

First and second semesters. Lecture, demonstration, and skill training in first aid measures for resuscitation, hemorrhage control, shock, burns, poisons, and bone injuries. Red Cross and Medical Self-Help certification awarded.

HLTH 60. INSTRUCTOR'S COURSE IN FIRST AID. (2)

First and second semesters. Prerequisite, Health 50 or equivalent. Advanced consideration of first aid techniques; orientation to methods, techniques, and teaching aids; practical classroom instruction required. Red Cross instructor's certification awarded.

HLTH 70. SAFETY EDUCATION. (3)

First and second semesters. Safety in the home, school, and community. Safety education programs in the public schools.

HLTH 80. THE DRIVER AND HIS CHARACTERISTICS. (3)

First and second semesters. Prerequisite, Health 70. The aim of this course is to treat the driver behavior problem in its relation to many of the psychophysical factors and forces in the traffic environment that impinge upon the man behind the wheel.

For Advanced Undergraduates and Graduates²⁶

HLTH 105. DRIVER EDUCATION AND TRAFFIC SAFETY I. (3)

First and second semesters. Summer session. Prerequisites, Health 70, 80. This course is a study of the place of the automobile in modern life and deals with the fundamentals, principles, practices, and content of high school driver education and traffic safety. Laboratory experience consists of observation and experience in teaching beginners to drive in dual control cars and simulators.

HLTH 110. INTRODUCTION TO SCHOOL HEALTH EDUCATION. (2)

First and second semesters. Prerequisites, Health 5 or Health 40. This course deals with the aspects of school health: health environment, health services,

and health education. The relationships of the school health program and the general education program are emphasized. The roles of teachers, administrators, health specialists and others in related fields are discussed.

HLTH 120. METHODS AND MATERIALS IN HEALTH EDUCATION. (3)

First and second semesters. Summer session. Prerequisites, Health 5 or Health 40; Health 110 or consent of instructor. The purpose of this course is to present the interrelationships of curriculum planning, methodology, and the selection and use of teaching aids and materials. Special problems associated with health teaching are discussed. Students will become familiar with a variety of resources.

HLTH 140. CURRICULUM, INSTRUCTION AND OBSERVATION. (3)

First and second semesters. Summer session. Prerequisites, Health 40, 70, 110, 120. A course designed to provide directed observation and discussion, coordinating these experiences with those from previous methods courses in the development of curricula for health and physical education. The course is planned to prepare for student teaching which follows in the same semester. The observations will be made of health programs in junior and senior high schools. This course must be taken during the semester in which the student is doing student teaching.

HLTH 145. DRIVER EDUCATION AND TRAFFIC SAFETY II. (3)

First and second semesters. Summer session. Prerequisites, Health 70, 80, 105, or their equivalents. Comprehensive programming for driver education; teaching to meet driving emergencies and winter conditions; resources and agencies; the teacher and driver education; consumer education, insurance and liability.

HLTH 150. HEALTH PROBLEMS OF CHILDREN AND YOUTH. (3)²⁷

First and second semesters. Summer session. This course involves a study of the health needs and problems of pupils from the primary grades through high school. Physical, mental, and psychosomatic aspects of health are considered in relation to the developmental and school levels. Consideration is given to such topics as diet selection and control; exercise, recreation and rest; emotional upset and its implications; and psychosexual development and problems. The role of the teacher and parent in encouraging optimal health is emphasized.

HLTH 155. PHYSICAL FITNESS OF THE INDIVIDUAL. (3)²⁷

First and second semesters. Summer session. A study of the major physical fitness problems confronting the adult in modern society. Consideration is given to the scientific appraisal, development and maintenance of fitness at all age levels. Such problems as obesity, weight reduction, chronic fatigue, posture, and special exercise programs are explored. This course is open to persons outside the fields of Physical Education and Health.

HLTH 160. PROBLEMS IN SCHOOL HEALTH EDUCATION IN ELEMENTARY AND SECONDARY SCHOOLS. (2-6)²⁷

First and second semesters. Summer session. This is a workshop type course designed particularly for in-service teachers to acquaint them with the best

²⁶ This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

²⁷ This course may be taken for graduate credit with the permission of the advisor. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

methods of providing good health services, healthful environment and health instruction.

HLTH 165. ORGANIZATION, ADMINISTRATION AND SUPERVISION OF SCHOOL SAFETY EDUCATION. (3)

First and second semesters. Summer session. Prerequisites, Health 70, 80, 105, 145 or their equivalents. Designed for teachers, school administrators, college instructors and others responsible for directing or supervising safety programs in the schools. Deals with the problems, policies, practices and procedures involved in the organization, administration and the supervision of a comprehensive accident prevention and safety education program for the schools. Considers integration factors of the school safety programs with the special emphasis on traffic programs.

HLTH 170. THE HEALTH PROGRAM IN THE ELEMENTARY SCHOOL. (3)²⁵

Second semester. Summer session. Prerequisites, Health 5, or 40; 110. This course, designed for the elementary school classroom teacher, analyzes biological, sociological, nutritional and other factors which determine the health status and needs of the individual elementary school child. The various aspects of the school program are evaluated in terms of their role in health education. The total school health program is surveyed from the standpoint of organizing and administration, and health appraisal. Emphasis is placed upon modern methods and current materials in health instruction. (The State Department of Education accepts this course for biological science credit.)

HLTH 175. PROBLEMS IN DRIVER AND TRAFFIC SAFETY EDUCATION. (3)

First and second semesters. Summer session. Prerequisites, Health 70, 80, 105, 145, or their equivalents. An advanced course which gives consideration to the individual problems encountered in teaching driver and safety education. The psychology of teaching and learning are emphasized. Consideration is given to the implications of emotion and attitude factors in driver and traffic education. The course includes an examination of existing courses of study, research, supervisory and evaluated practices.

HLTH 178. FUNDAMENTALS OF SEX EDUCATION. (3)²⁵

This course is concerned with basic information regarding the physical, psychological, social, historical, semantic and comparative cultural aspects of sex. The adjustment needs and problems of children and adults during the course of maturing and aging are studied; and special consideration is given to the sex education program in schools.

HLTH 180. MEASUREMENT IN PHYSICAL EDUCATION AND HEALTH. (3)²⁵

First and second semesters. Summer session. Two lectures and two laboratory periods per week. The application of the principles and techniques of educational measurement to the teaching of health and physical education; study of functions and techniques of measurements in the evaluation of student progress toward the objectives of health and physical education, and in the evaluation of the effectiveness of teaching.

²⁵ This course may be taken for graduate credit with the permission of the adviser. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

HLTH 188. CHILDREN'S PHYSICAL DEVELOPMENT CLINIC. (1-4)

First and second semesters. Summer session. Prerequisite, at least junior standing in health, physical education and recreation, or by special permission of the director. An opportunity to acquire training and experience in a therapeutically oriented physical education-recreation program for children referred by various education, special education, medical and psychiatric groups.

HLTH 189. FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)²⁸

First and second semesters. Summer session. A course designed to meet the needs of persons in the field with respect to workshop and research projects in special areas of knowledge not covered by regularly structured courses.

Note: The maximum total number of credits that may be earned toward any degree in physical education, recreation, or health education under PHED, RECR, HLTH, or EDUC 189 is six.

HLTH 190. ORGANIZATION AND ADMINISTRATION OF SCHOOL HEALTH PROGRAMS. (3)

Second semester. Summer session. The three major aspects of the school health program are considered. Problems connected with health services, health instruction, and the health aspects of the school environment are discussed. The responsibilities of school personnel are delineated.

*For Graduates***HLTH 200. SEMINAR IN PHYSICAL EDUCATION, RECREATION, AND HEALTH. (1)**

First and second semesters. Summer session.

HLTH 210. METHODS AND TECHNIQUES OF RESEARCH. (3)

First and second semesters. Summer session. A study of methods and techniques of research used in health education; an analysis of examples for their use; and practice in their application to problems of interest to the student.

HLTH 220. SCIENTIFIC FOUNDATIONS OF HEALTH EDUCATION. (3)

First semester. Summer session. The major concern of the course is to consider current concepts in many of the health topical areas. This information is then Corroborated by the research done in many scientific disciplines. Emphasis is placed on the behavioral sciences.

HLTH 240. MODERN THEORIES OF HEALTH. (3)

First and second semesters. Summer session. Various theories of human health have been proposed and partially tested scientifically. These are examined in an effort to determine their status and validity.

HLTH 250. HEALTH PROBLEMS IN GUIDANCE. (3)

First and second semesters. Summer session. A course designed to familiarize guidance counselors with principles of health and with common deviations from health, especially during the school years. Implications of health for pupil effectiveness in the entire curriculum, including extra-class activities, are dealt with.

²⁸ This course may be taken for graduate credit with the permission of the adviser. Students taking 100 level courses for graduate credit will be expected to carry out a special project.

Special attention is given to psychosomatic disturbances which are commonly an aspect of personal problem situations. Methods of dealing with health problems and utilizing available resources of school and community are discussed.

HLTH 260. PUBLIC HEALTH. (3)

Second semester. The course is designed to familiarize the student with the structure, function, and problems of public health agencies from the local, state, national and world levels. The role of education in problem solving is emphasized. School health educators are shown relationships which exist with public health educators.

HLTH 270. STATUS AND TRENDS IN HEALTH EDUCATION. (3)

First and second semesters. Summer session. This course is concerned with analyzing the current status and implications for future trends in the various areas of health education.

HLTH 280. THE SCIENTIFIC BASES OF EXERCISE. (3)

First and second semesters. Summer session. Prerequisites, anatomy, physiology, PHED 100, PHED 160, or the equivalent. A critical analysis of the role of physical exercise in modern society with attention given to such topics as: the need for physical exercise, its chronic effects, the role of exercise in attaining good physical condition and fitness, factors determining championship performances, and physical fatigue.

HLTH 287. ADVANCED SEMINAR. (1-3)

First and second semesters. Summer session. Prerequisites, Health 220, or permission of the instructor. This course is a study of the current problems and trends in the selected field of health education.

HLTH 288. SPECIAL PROBLEMS IN HEALTH EDUCATION. (1-6)

First and second semesters. Summer session. Master or doctoral candidates who desire to pursue special research problems under the direction of their advisors may register for 1-6 hours of credit under this number.

HLTH 290. ADMINISTRATIVE DIRECTION OF HEALTH EDUCATION. (3)

First and second semesters and summer. This course is devoted to the analysis of administration problems in the light of sound educational practice. Students concentrate their efforts upon their own on-the-job administrative problems and contribute to the solution of other class members' problems.

HLTH 291. CURRICULUM CONSTRUCTION IN HEALTH EDUCATION. (3)

First and second semesters and summer. A study of the principles underlying curriculum construction in Health Education and the practical application of these principles to the construction of a curriculum for a specific situation. The specific content of this course is adjusted to meet the needs of the students enrolled in it.

HLTH 399. RESEARCH—THESIS. (1-5)

First and second semesters and summer. Students who desire credit for a master's thesis, doctoral dissertation, or a doctoral project should use this number.

BASIC PHYSICAL EDUCATION COURSES FOR NON-MAJOR MEN AND WOMEN

In the "General and Academic Regulations" (pps. 65-67) the basic requirements in Physical Education for men and women are stated under the section entitled "Physical Education" as follows:

All undergraduate men and women students who are registered for more than eight semester hours of credit are required to enroll in and successfully complete two prescribed courses in physical education for a total of two semester hours of credit. The successful completion of these courses is required for graduation. These courses must be taken by all eligible students during the first two semesters of attendance at the University, whether or not they intend to pursue a degree. Men and women who have reached their thirtieth birthday are exempt from these courses. The thirtieth birthday must precede the Saturday of registration week. Students who are physically disqualified from taking these courses must enroll in adaptive courses for which credit will be given. A transferring student who can meet the academic requirements of his college and the requirements of the University by completing 30 academic hours will not be required to register for physical education. Students with military service may receive credit for these courses by applying to the Director of the Men's Physical Education Program.

Students majoring or minoring in physical education, recreation, or health education may meet these requirements by enrolling in special professional courses.

The program of physical education offers the college student an opportunity to acquire skills, knowledges, and appreciations in a variety of physical and sports activities. Adequate participation now and in the future will contribute to more efficient physiological functioning, effective movement, improved human relations, and worthwhile use of leisure time. Students are urged to develop new skills as well as to select those in which they would like to have further experience.

The complete course offering for any one semester is listed in the "Schedule of Classes" for each semester. Special attention should be given to the time, place, and section of the activities. When selecting course for credit, consideration should be given to the following points:

MALE STUDENTS: All male students are required to take the basic program, PHED 1, Orientation to Physical Education, the first semester in which they are enrolled in the University. During this course, a swimming skill test and a motor performance test will be given. If a student fails either test, he must select elementary swimming or basic motor fitness course, whichever may apply. If the student fails both tests, the preferred course selection is swimming. Other students may select any activity listed in PHED 3 as their second semester activity.

PHED. courses may be taken for credit beyond requirement or for audit.

Each male student enrolled in required physical education will be furnished a red and black reversible T-shirt, black trunks, socks, supporter, and towel.

Gymnasium shoes, and for some classes, sweat clothes must be furnished by the student.

At the end of each semester or upon withdrawal from the University each student must return his clothing to the equipment custodian or he will be billed for all items of clothing which are missing.

UNIFORM: Each woman student is expected to provide herself with gymnasium costume consisting of dark green bermuda shorts, white blouse, white socks and tennis shoes.

ALL STUDENTS:

1. A laboratory fee is assessed for all Physical Education courses.
2. All courses designated with an asterisk (*) are co-ed courses with appropriate numbered courses combined to form a class.
3. Other courses are designated with special markings indicating that there is a prerequisite to that course. All such markings are explained with a footnote at the bottom of each page in the Schedule of Classes. Examples of prerequisites are: Swimming is a prerequisite to sailing and canoeing and a weekend field trip is required for camping, etc.
4. A special fee of \$26.00 is assessed for riding.

WOMEN STUDENTS: All women students will select the activity in which they would like to participate. However, a swimming skill test will be given to all students and those not passing will be assigned an elementary swimming class in PHED 4. The other students will continue in their chosen activity. The second course may be selected from either PHED 2 or PHED 4.

In brief, those students who are not proficient in swimming must complete one course in PHED 4.

The Basic Program Courses are designated as:

- | | | |
|------|-----|-----------------------------------|
| PHED | 1 | Orientation to Physical Education |
| PHED | 2 | Physical Education Activities |
| PHED | 3 | Basic Physical Education |
| PHED | 4 | Swimming |
| PHED | 105 | Physical Activities (Summer) |

REQUIRED HEALTH EDUCATION FOR MEN AND WOMEN

All freshmen are required to complete one semester of Science and Theory of Health (HLTH 5) for graduation. Students who demonstrate proficiency in Science and Theory of Health on a test to establish credit may be exempted from HLTH 5. Transfer students who do not have credit for HLTH 5, or its equivalent, must complete it before graduation. This semester course is designed to meet the functional health needs and interests of college men and women. The basic units of instruction have been evolved from present day scientific backgrounds. It is hoped that through this health course the students

will be better able to develop sound attitudes, habits and knowledge that will facilitate a more effective type of everyday living. Audio-visual aids, reading, reports, guest speakers, and lectures help to enrich the class discussions. The University environment, the personal and group adjustments which the students must make are considered to form the core of this course.

Men and women who have reached their thirtieth birthday at matriculation are exempt from HLTH 5.

Military Service does *not* exempt the student from the Health 5 requirement.

HLTH 5. SCIENCE AND THEORY OF HEALTH. (2)

First and second semesters. A course concerned primarily with sound health knowledge attitudes and skills as they apply to the individual. The major subjects dealt with in this course are: mental health and social adjustment; human reproduction and sex education; organic efficiency; ecological and environmental health hazards; and the need for health education and community action from world to local levels.

STUDENT ORGANIZATIONS SPONSORED BY THE COLLEGE

PHI ALPHA EPSILON: Honorary Society of the College of Physical Education, Recreation, and Health.

The purpose of this organization is to recognize academic achievement and to promote professional growth by sponsoring activities in the fields of physical education, recreation, health, and related areas.

Students shall qualify for membership at such time as they shall have attained junior standing in physical education, health, or recreation, and have a minimum overall average of 2.7 and a minimum professional average of 3.1. Graduate students are invited to join upon passing the Graduate Diagnostic Examination.

The organization is open to both men and women.

MAJORS' CLUB: All students enrolled in the college are eligible for membership in this organization. It conducts various professional meetings, brings in speakers and promotes various co-recreational activities. It has sponsored trips to District and National conventions of the American Association for Health, Physical Education, and Recreation, and is chartered as a student major club of that organization.

SIGMA TAU EPSILON: This society, founded in 1940, selects those girls who have attained an overall 2.5 average and demonstrated outstanding leadership, service and sportsmanlike qualities in the organization and activities of the Women's Recreation Association and its affiliated groups.

AQUALINERS: This synchronized swimming club is open to all men and women registered in the University. Through weekly meetings the group concentrates on additional stroke perfection, individual and group stunts, diving, and experimentation with various types of accompaniment and choreographic techniques. An original water show is presented each spring and several demonstrations are given each year. Tryouts are held twice a year—once at the beginning of the fall semester, and again after the water show during the spring semester.

UNIVERSITY OF MARYLAND RECREATION AND PARKS SOCIETY: In the fall of 1959 the University of Maryland Recreation and Parks Society was formed by the undergraduate and graduate major and minor students of the College. The Society, an affiliate of the state and national recreation organizations, provides opportunities for university and community service, for rich practical experience, and for social experiences for those students having a mutual professional recreation interest.

GYMKANA TROUPES: The Gymkana Troupe includes men and women students from all colleges that wish to express themselves through the medium of gymnastics. These individuals coordinate their talents in order to produce an exhibitional performance that has been seen in many places including Bermuda, Iceland, Azores, Idaho, Montana, and the Eastern Seaboard of the United States. The organization has three principal objectives: (1) to provide healthful, co-recreational activities that provide fun for the students during their leisure hours; (2) to promote gymnastics in this locality; and (3) to entertain our students and people in other communities.

This organization is co-sponsored by the Physical Education Department and the Student Government Association; and it welcomes any student, regardless of the amount of experience, to join and to have fun.

INTRAMURALS FOR MEN: The Intramural Department offers an extensive opportunity for all men to participate in a recreational program of either individual or team sports. A variety of activities are available to fill the student's leisure time and develop skills which may be carried over into later life. Also, many desirable attributes, such as fair play, leadership, teamwork and sportsmanship, are encouraged and developed by the student participating in the program.

Leagues and tournaments are conducted in the following sports: touch football, horseshoe pitching, tennis, cross country, track and field, basketball, table tennis, badminton, boxing, wrestling, bowling, volleyball, swimming, foul shooting and softball.

Management and officiating in intramural sports are conducted by students majoring in physical education under the supervision of the Director of Intramurals and under policies and regulations established by the Intramural Council.

WEIGHT LIFTING CLUB: The University of Maryland Weight Lifting Club is open to all students and faculty for exercise with the weights throughout the week during all hours that Cole building is open.

The University of Maryland Olympic Barbell Club is a more highly organized group of the original club. It is recognized by the Student Government Association. Bi-monthly meetings are held, which assist in leadership, offer clinics and demonstrations, etc.; participate in competition, and earn awards of recognition.

WOMEN'S RECREATION ASSOCIATION: *All women students of the University are members of the Women's Recreation Association*, an affiliate of the Athletic and Recreational Federation of College Women. Under the leadership of its elected student officers and representatives and appointed sports managers, the WRA sponsors a full program of intramural, extramural, and interest group activities. These activities seek to develop new interests and skills for leisure-time enjoyment, provide opportunities for continuing both old and new interests, and provide a democratic atmosphere for educational leadership experiences. Included

are free and tournament play in archery, badminton, basketball, bowling, fencing, field hockey, golf, softball, swimming, table tennis, and volleyball; social events; and co-recreational activities in bowling, badminton, volleyball. Intramural tournaments are organized through the dormitory, sorority, and "day dodger" groups of the University. Sports Days and Play Days with other colleges and universities enable the more skilled students to participate with others of similar abilities. Opportunities are also provided for officiating experience and for the earning of official WNORC ratings in basketball, field hockey, swimming, and volleyball.

Various special groups and clubs interested in recreation exist on campus outside the Women's Recreation Association program and offer rich opportunities for the development of other recreational interest. Some of these are the Terrapin Trail Club, Chess Club, Gymkana Troupe, Sailing Club, Ski Club, and musical and dramatic groups.



The Faculty

Administrative Officer

FRALEY, Lester M., *Professor and Dean of the College of Physical Education, Recreation and Health*

A.B., Randolph-Macon College, 1928; M.A., Peabody College, 1937; Ph.D., 1939.

Professors

EYLER, Marvin H., *Professor and Head, Department of Physical Education*

A.B., Houghton College, 1942; M.S., University of Illinois, 1948; Ph.D., 1956.

HARVEY, Ellen E., *Professor and Head, Department of Recreation*

B.S., New College, Columbia University, 1935; M.A., Teachers College, Columbia University, 1941; Ed.D., University of Oregon, 1951.

HUMPHREY, James H., *Professor of Physical Education and Health*

A.B., Denison University, 1933; A.M., Western Reserve University, 1946; Ed.D., Boston University, 1951.

HUSMAN, Burris F., *Professor of Physical Education*

B.S., University of Illinois, 1941; M.S., 1948; Ed.D., University of Maryland, 1954.

JOHNSON, Warren R., *Professor of Physical Education and Health*

B.A., University of Denver, 1942; M.A., 1947; Ed.D., Boston University, 1950.

Associate Professors

CLARKE, David H., *Associate Professor of Physical Education*

B.S., Springfield College, 1952; M.S., 1953; Ph.D., University of Oregon, 1959.

CRONIN, Frank H., *Associate Professor of Physical Education; Head Golf Coach*

B.S., University of Maryland, 1946.

JONES, Herbert L., *Associate Professor of Health Education and Head Dept. of Health Education*

B.S., Wisconsin State College, 1954; M.S., University of Wisconsin, 1957; H.S.D., Indiana University, 1964.

KEHOE, James, *Associate Professor of Physical Education, Director of Intramurals, and Head Track Coach*

B.S., University of Maryland, 1940.

KELLEY, David L., *Associate Professor of Physical Education*
A.B., San Diego State College, 1957; M.S., University of Southern California, 1958;
Ph.D., 1962.

KRAMER, George P., *Associate Professor of Physical Education*
B.S., University of Maryland, 1953; M.A., 1956; Ph.D., Louisville State University,
1967.

SHUSTER, Arnold A., *Associate Professor of Recreation*
B.A., Sir George Williams University (Canada) 1954; M.S., Indiana University,
1966; Ph.D., University of Illinois, 1968.

STEEL, Donald H., *Associate Professor of Physical Education*
B.S., Trenton State Teachers College, 1955; M.A., University of Maryland, 1957;
Ph.D., Louisiana State University, 1964.

STULL, G. Alan, *Associate Professor of Physical Education*
B.S., East Stroudsburg State College, 1955, M.S., The Pennsylvania State College,
1957, Ed.D., 1961.

TOMPKINS, Theron A., *Associate Professor of Physical Education*
B.S., Eastern Michigan College of Education, 1926; M.A., University of Michigan,
1939.

WOODS, Albert A., *Associate Professor of Physical Education*
B.S., University of Maryland, 1933; M.Ed., 1949.

Assistant Professors

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